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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,314	04/10/2001	Christophe Dupont	112701-239	4353

29157 7590 10/23/2007

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EXAMINER	
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ART UNIT	PAPER NUMBER
1794	

NOTIFICATION DATE	DELIVERY MODE
10/23/2007	ELECTRONIC

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/833,314
Filing Date: April 10, 2001
Appellant(s): DUPONT ET AL.

Robert M. Barrett

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/12/07 appealing from the Office action mailed 9/20/06.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

Appellants' statement of the status of amendments after Final Rejection is silent in this regard. In fact, no amendment after Final Rejection has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

Full translations of previously applied ERRASS, the two QP CORP patents, HOASHI, HONMA ET AL and SONOYA, are included and being mailed with the Answer. These references are not being relied on for any new teachings. These

references are still being relied upon for the reasons of record as of the time of the Final Rejection; i.e., as further evidence to show the art taken as a whole is replete with examples of multi-phase food products wherein the phases are given various geometries and cross-sectional shapes.

EP 769,252	OHBA ET AL (Europ.)	4-1997
GB 341,760	VICKERS (G. Britain)	1-1931
WO 98/05219	MAY (WIPO)	12-1998
GB 1,327,351	QUAKER OATS (G. Britain)	8-1973
3,738,847	BECHTEL	6-1973
2,421,199	GUTMANN	5-1947
GB 2,194,125	FROEBEL (G. Britain)	3-1988
2,937,095	ZITIN	5-1960
3,385,712	DODGE ET AL	5-1968
2,344,901	ROUTH	3-1944
GB 1,583,351	McMAHON (G. Britain)	1-1981
EP 675,046	ERRASS (Europ.)	10-1995
AU 50797/96	HILLERBRAND	10-1996
JP59-31677	QP CORP	2-1984
JP61-100174	QP CORP	5-1986
Appellant's Admission of the Prior Art		
5,518,746	DIAZ	5-1996

JP 62-104566	HOASHI (Japan)	5-1987
JP 59-159758	HONMA ET AL (Japan)	9-1984
JP 57-12987	SONOYA (Japan)	1-1982

Upon reconsideration, Henkel (GB 1486634) and Mandanas (WO 94/26606), employed in the Final Rejection, have been withdrawn as being superfluous.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohba et al (EP '252) in view of Vickers (GB '760) and May et al (WO'219), or vice versa, i.e., Vickers in view of Ohba et al and May et al, both further in view of Quaker Oats (GB '351), and Bechtel ('847), further in view of Gutmann ('199), Froebel et al (GB '125), Zitin ('095), Dodge et al ('712) and, further in view, Henkel (GB, '634), Mandanas (WO '606), Routh ('901), McMahan (GB '351), Errass (Ep '046), Hillebrand (Austral. '797/96), QP Corp (Jp '677) and QP Corp (Jp '174), further in view of applicants admission of the prior art, further in view of Diaz(5,518,746), Hoashi (JP 62-104566), Honma et al (JP59-159758), and Sonoya (JP57-12987).

In regard to claim 1, Ohba et al (EP'252) discloses a canned pet food having an upper end and a lower end, wherein the pet food comprises two phases, which include protein and carbohydrate, and wherein the two phases have different appearances from each other because they are derived from substantially different materials and are shown that way in the figures. Claim 1 differs from Ohba et al essentially in the fact that

claim 1 recites that the two phases are arranged such that there is an outer tubular phase which extends from the lower end to the upper end, and a substantially cylindrical inner phase, which extends from the lower end to the upper end of the outer phase, whereas Ohba et al discloses the phases are arranged adjacent to, but not in tubular/cylindrical shape. That is, claim 1 differs from Ohba et al only in the geometry of the phases. It is noted that appellant's disclosed reason to provide composite food products with phases of different composition and appearance, is to provide products having new and interesting appearances, (for either the pet or its owner?). Once it was known to provide a package with two or more different phases, the particular shape of the phases in the package is seen to have been an obvious matter of choice and/or design, especially in view of the fact that the art is replete with evidence of varying the cross sectional geometry of two or more phases, including tubular outer phases and cylindrical inner phases. For example, as evidenced by Vickers, it was notoriously conventional to provide composite food products wherein the phases form an outer tubular phase and an inner cylindrical phase as recited. Vickers, for example, discloses the phases can be meat products, which differ from each other in their texture and appearance, with the outer phase confining a softer core filling. May et al can be relied on as further evidence of providing two composite food products, and specifically, pet food products, wherein there is an outer phase and an inner phase, and wherein both the outer phase and the inner phase includes an edible source of carbohydrate. May et al also teaches the composite two phased pet food product is canned, which, of course, is a notoriously conventional packaging expedient for all types of food; i.e., pet food or

food destined for human consumption. As noted above, Appellant's primary disclosed reason for providing the composite product with the geometry of the phases is to provide two products, which contrast in appearance and/or texture, to provide new and interesting appearances. This is exactly the objective of May et al as well. Froebel et al, although teaching individual composite food pieces, nevertheless, further evidences that composite, concentric food products, such as pet foods, were well established in the art. To further evidence the conventionality of plural phase food products having an inner phase and a tubular outer phase, and to emphasize appellant is not the first to employ this specific geometric configuration in composite food products, Gutmann, Froebel et al, Zitin, and Dodge et al are relied on as further evidence that a tubular outer food phase and an inner core composite food phase is notoriously conventional. To modify Ohba et al and substitute tubular/cylindrical shaped phases for adjacent polygonal shaped phases, for its art recognized and appellant's intended function of new and interesting appearances, is seen to have been an obvious matter of choice and/or design. McMahon, Hillerbrand et al, Errass, the two QP Corp references, Quaker Oats, Bechtel, Routh, Diaz, Hoashi, Honma et al, and Sonoya are all relied on as further evidence to show the art taken as a whole is replete with examples of multi-phase food products wherein the phases are given various geometries and cross-sectional shapes. Reference is made to In re Gorman 18USPQ2d,1886, wherein the Court noted that where teachings relied upon to show obviousness were repeated in a number of references, the conclusion of obviousness was strengthened.

As noted above, the claims are also rejected under 35USC103(a) over the same group of references, but employing Vickers as the primary reference. In this regard, Vickers teaches that composite foods, which are provided with different appearances between phases, imparts increased interest in the food. Vickers also teaches the recited geometry of the phases; i.e., an outer tubular phase within an inner cylindrical phase. Claim 1 differs from Vickers in the particular type of food, as well as the fact the composite food is canned. As fully detailed above, the art taken as a whole, including Ohba and May et al, disclose it was notoriously conventional to provide plural phase food products that can be food for pets or food for human consumption, and that it was also well established to can plural phase food products. To therefore modify Vickers and substitute one conventional composite food formulation for another conventional food formulation would have been an obvious function of who is to be the intended consumer of the food, and to can the product for preservation and marketing, would also have been obvious in view of the art taken as whole.

In regard to claim 2, claim 2 essentially recites all the limitations of claim 1 and then further recites the process of making the recited canned pet food product. Thus, claim 2 is rejected for all of the reasons given above in regard to claim 1. In regard to the product by process language in claim 2, how the phases were formed in the container is not seen to be limiting on the recited article, which is a canned pet food. The final article is a canned, dual phase pet food with an outer, tubular phase and a cylindrical inner phase, wherein both phases include carbohydrate and protein and have been heated, which article is shown to have been obvious in view of the art taken as a

whole. In any case, Routh clearly evidences the fact that it was well established to fill a container with a first outer phase food product and then form a bore(s) in the outer phase, and fill the bore(s) in the outer phase with a second inner phase food product. In regard to claim 3, which recites that the outer phase is a thermally gelled mixture, the art taken as a whole, including Ohba, Vickers and May et al evidence the fact that it was conventional, and thus obvious, to include a gelling agent in one or both of the phases to form a gelled mixture, with May et al and appellant's admission of the prior art, specifically teaching thermally gelled pet food compositions and formulated emulsion pet food compositions, in the recited orientation. Thus, May et al and appellant's admission of the prior art evidence that it would have been obvious to employ chunks of a formulated emulsion product in a gravy (claim 4), that it would have been obvious to employ phases within the recited volume range relative to each other (claim 5), and that it would have been obvious to provide a moisture content within the recited range (claim 8). Claim 6, an article claim, is rejected for the reasons given above. Claims 11-13,15 and 17, which are essentially duplicates of claims 3-5 and 8, and which recite compositions and volume relationships between phases, are rejected as having been obvious for the reasons given above. See, especially, in this regard, May et al, who, as noted above, disclose the composition and volume relationships recited. In regard to claims 9 and 10, which recite a method for producing a canned pet food product, as discussed above, the art taken as a whole, including Ohba et al, Vickers, May et al and Routh, disclose it would have been obvious to fill a can to provide an outer tubular phase and an inner cylindrical phase, wherein the phases include carbohydrate and

protein, and the process employs forming a bore in the outer phase and filling the bore. In regard to claims 7,14 and 16, which recite that the product has a height at least as large as its diameter, the art taken as a whole discloses this dimensional relationship is, of course, conventional. See, for example, in this regard, McMahon, Quaker Oats and Bechtel. To modify the combination and provide the product such that the height is at least as large as its diameter is seen to have been an obvious matter of choice and/or design in view of the art taken as a whole.

(10) Response to Argument

All of appellant's urgings have been fully and carefully considered but are not found to be convincing. Appellant's urgings begin on page 12 of the Brief. On page 12 of the Brief, it is noted that the way the rejection is phrased, makes the rejection difficult to address. The Brief particularly notes the use, in the rejection, of the phrase "or vice versa", and the Brief also alleges that there is no principal reference. These urgings are not convincing and are also inaccurate. The statement of the rejection is perfectly clear, as is the explanation of the rejection, which has been fully and clearly detailed. The "or vice versa" phrase is clearly explained in the statement of the ground of rejection. Thus, there should be no confusion in the statement of the rejection that the claims are rejected over Ohba et al in view of Vickers and May et al or Vickers in view of Ohba et al and May et al, both further in view of the secondary art. Also, there should be no confusion in the fact that there are two rejections, both relying on the same group of references for evidence of obviousness and that there are indeed two "principal" or primary references – Ohba et al in the first rejection and Vickers in the second rejection.

Also, it is not seen why the number of references provides any confusion, since the rejection clearly explains how the references are being applied. The invention is directed to canned pet foods, wherein the pet food is provided in the cans in two discernible phases with specific geometries. The rejections rely on overwhelming evidence that whether a food product is produced for pet or human consumption, the art is replete with examples of providing plural discernible phases having various geometries including the recited shapes. On pages 12-15 of the Brief, each reference is argued separately as if it were applied alone, in a vacuum. The discussion of the references does not address the rejections, which rejections are based on what the art taken as a whole teaches and how the references are applied in the rejections. The references are not applied separately under 35USC102(b), anticipation, but rather under 35USC103(a), obviousness. The analysis in the Brief of each reference does not address how the reference fits into the rejections, which rely on both Ohba et al and Vickers as separate primary references. For example, in the discussion of May et al, it is urged that several of the other applied references teach away from a combination of either reference with May et al. However, May et al has not been relied on as a primary reference, so that the comparison to May et al is not relevant to the rejections. Also, beside the fact, these urgings are not directed to the rejections which employ Ohba et al and Vickers as separate primary references, these urgings also are inaccurate. For example, May et al is not being relied on for the specific recited geometry of the phases (i.e., an outer tubular phase and an inner cylindrical phase), This conventional geometry is evidenced by other references as detailed above. Nevertheless, May et al does

disclose that the two discernible pet food phases (which contain the recited compositions and the recited volume relationships) can be provided such that the recess, which is formed in one phase, which is then filled with a second phase, can extend entirely through the base. Thus, May et al does disclose an outer and inner two phase, retorted canned pet food, whose shape and appearance is disclosed as providing "new and interesting textures and appearances, to further stimulate consumer interest". This, of course, is appellant's reason for providing two discernible phases and geometry.

In analyzing each of the rest of the applied references in the Brief, in an attempt to show that the references are either not combinable, or there is no suggestion to combine, or teach away, etc., the urgings make the same errors made in discussing May et al. That is, the urgings are not directed to how the references have been applied. Although it would not appear that no one reference, individually, specifically teaches all of the elements, i.e., the recited food composition with the recited geometry with the recited can, as noted above, this issue only addresses novelty under 35USC102(b), and not obviousness under 35USC103(a). The fact is, that the art, taken as a whole, teaches that it was conventional to provide composite, multiphase foods in general, that have the recited geometry/shape, wherein the composite foods are disclosed as being packaged or not packaged; that it was conventional to provide composite, multiphase pet foods with the recited composition in retort cans; that it was conventional to provide shaped, composite multiphase pet foods in a can wherein one phase surrounds a second phase; and that it was conventional to provide composite, multiphase foods in

general, with the recited geometry/shape in a can. The analysis of each reference in the Brief overlooks what the reference is being relied on to show and overlooks what is already disclosed in either the primary reference or other secondary references. For example, the remarks urge that one or more of the secondary references do not show, for example, the recited shape of the multiphase product in a can, or the recited shape with the recited composition. The remarks are replete with this type of urging, wherein it is urged that a particular reference does not teach one or more recitations, which recitations are already shown and evidenced by another reference relied upon in the rejection. Thus, and not to belabor this point too much, a secondary reference, which teaches a composite, multiphase food in a can does not have to teach the specific recited composite multiphase food composition for the rejection to be proper, when the specific composite multiphase food composition is already taught in another reference. The fact is, there appears to be nothing magic in placing a multiphase pet food of specific shape/geometry in a can, especially when it was conventional to place multiphase pet foods in cans; when it was conventional to place other multiphase foods having the same specifically, recited shape in cans; when it was conventional to provide the specifically recited multiphase composition in cans; and when it was conventional to generally provide the specifically recited shape/geometry for multiphase foods in general. The urgings emphasize a specific shape or geometry for the two phases, which shape or geometry is shown by the art taken as a whole to be a notoriously conventional multiphase structure or design or pattern; which structure, design or pattern achieves no new or unexpected result. The result put forward is a new or

interesting appearance, but the art taken as a whole clearly evidences the fact that the appearance is not new, and the art taken as a whole recognizes that appearance is advantageous in foods, whether the food is to be marketed as pet foods or food for human consumption.

Finally, on page 16, it is urged that the canned pet food of Appellant's invention has the advantage of being "suitable" for use in larger cans, where the height of the can is at least as large as the diameter of the can. It is then urged that in taller cans filled with a product such as the one disclosed by May et al, the upper and base layers would be more difficult to shake out into the pet's bowl or dish. As discussed in a previous Office action, this urging is merely an opinion, not supported by any factual, probative evidence. Also, the urging is vague. For example, how much "more difficult" would it be to shake the product into a bowl or dish? Also, Quaker Oats and Bechtel disclose composite dual phase pet food products, wherein the outer phase is a ground meat based mixture, and wherein the pet food is packaged in a tall can, which is at least as large as the diameter of the can. Finally, in this regard, since it appeared that May et al and the present application had the same assignee, and May et al was silent as to the recited dimensional relationship between product height and product diameter, previous Office actions, noting that May et al was silent in this regard, made enquiries as to the dimensional relationship between these two dimensions in May et al. However, these enquiries were never addressed by appellant.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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PTO 08-0074

CC = EP
19951004
A1
0675046

ERRASS

ASSEMBLY FOR A FOOD PRODUCT ENTAILING A TUBE CONTAINING A PRODUCT WITH AT LEAST TWO CONSTITUENTS

[Ensemble pour produit alimentaire comprenant un tube contenant un produit à au moins deux constituants]

Werner Errass

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. OCTOBER 2007
TRANSLATED BY: THE MCELROY TRANSLATION COMPANY

PUBLICATION COUNTRY	(19):	EP
DOCUMENT NUMBER	(11):	0675046
DOCUMENT KIND	(12):	A1
PUBLICATION DATE	(43):	19951004 Bulletin 95/40
APPLICATION NUMBER	(21):	94105157.5
APPLICATION DATE	(22):	19940331
INTERNATIONAL CLASSIFICATION	(51):	B 65 D 1/00 B 65 D 35/24 B 65 D 77/08 A 23 L 1/225 A 23 L 1/24
INVENTOR	(72):	Werner Errass
APPLICANT	(71):	Societe des Produits Nestle S.A.
DESIGNATED CONTRACTING STATES	(84):	AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, NL, PT, SE
TITLE	(54):	Assembly for a food product entailing a tube containing a product with at least two constituents
FOREIGN TITLE	[54A]:	Ensemble pour produit alimentaire comprenant un tube contenant un produit à au moins deux constituants

The invention relates to an assembly for a food product entailing a tube containing a product with at least two constituents.

Tubes containing two constituents are already known. The patent CH 670 612 relates to a package for mayonnaise and ketchup but in which a tube with a special adaptor is used so that two constituents can be separated. Furthermore, the patent DE 1185981 relates to a process for filling a conventional tube in which the same mass but colored differently is apportioned in said tube. The first patent uses a special tube, and the second does not relate to the actual apportionment of different constituents.

The aim of the present invention is to be able to present a package in the form of a tube in which a conventional tube is used but which contains a product with two different constituents.

The invention relates to an assembly for a food product entailing a tube containing a product with at least two constituents, in which the tube is a normal tube, and the constituents are distributed around the axis of symmetry of the tube in an alternating manner with each constituent [extending] over the whole length of said tube.

Normal tube is understood to mean a tube which has a tube body, a mouth for discharge of the product and a closing cap such as that used conventionally for the packaging of mayonnaise, for example.

Different constituents are understood to mean constituents having different chemical compositions such as the following combinations, for example: mayonnaise/ketchup, mustard/ketchup, mayonnaise/mustard, mustard and/or ketchup containing a maximum of 40% oil and any other combination in the food domain with sweet constituents such as chocolate cream (mixture of chocolate, fat and thickener) / white chocolate cream (white chocolate, fat and thickener).

The aim of the present invention is to be able to distribute at least two products simultaneously from a conventional tube onto a plate for direct consumption or for the purpose of decoration, for example, on appetizers.

It is also possible to envisage the presence of three constituents in the tube, but the version with two constituents is preferred.

With the two constituents in consideration, it is calculated that they are apportioned in approximately equal quantities (in volume), and they are apportioned in the tube in such a way as to have two zones of one of the constituents and two zones of the other. It would also be possible to envisage three zones and more, but the solution with two zones is preferred.

It is obvious that since the two constituents have zones of contact over the whole length of the tube and are to be distributed simultaneously and equally, it is necessary for them to comply with certain physical constraints. For example, so that the constituents are distributed together well, it is necessary for the yield point of the mayonnaise to be between 100 and 140 Pa and for that of the ketchup and mustard to be between 60 and 120 Pa. Preferably, the yield point of the mayonnaise is on the order of 120 Pa.

Still for the same combination, if one wants to be sure that the products do not mix when they are distributed, it is necessary for the viscosity of the mayonnaise to be between 16,000 and 25,000 cP and that of the ketchup and mustard to be between 12,000 and 22,000 cP. Preferably, for the mayonnaise, the viscosity is between 18,000 and 20,000 cP. It is obvious that the yield point and viscosity values of ketchup and mustard are still as valid if these compounds contain up to 40% oil. Oil is understood to mean a mixture of ketchup, or respectively mustard, with mayonnaise.

The measurements of these two physical magnitudes are done with a Contraves Rheomat 108 E/R, Messystem 13 apparatus.

For mayonnaise, one works with an oil content between 40 and 80%, and preferably an oil content between 70 and 80%.

The product in tube form which is obtained, containing the two constituents, can be kept without refrigeration for a minimum duration of 6 months.

For reasons of viscosity, it is necessary for the aqueous phase, namely the ketchup and mustard phase, to contain between 2 and 8% thickener, this thickener preferably being modified starch. The pH of the two constituents is acidic, between 3.4 and 4.

For filling the tube, a special nozzle is used. Before filling, it is necessary to pasteurize the ketchup and mustard in order to make the desired shelf life possible. Concerning mayonnaise, it is prepared in a conventional manner and does not require any thermal treatment. Filling the tube takes place in an aseptic or very sanitary device.

The rest of the description is given in reference to the drawings in which

Figure 1 is a diagrammatic representation of the package according to the invention, and

Figure 2 is a cross section across line 2-2 of Figure 1.

Tube (1) has sealed tube bottom (3), tube body (2), mouth (4) for discharge of the two constituents and cap (5) for closing the tube. The combination of the two constituents is in the tube, as seen more precisely in Figure 2: there are ketchup (6) and mayonnaise (7) distributed around axis of symmetry 8 of tube (1). These constituents are distributed in two distinct zones.

When using the tube, one presses it and the two constituents come out simultaneously in equal quantities: no mixing of the two constituents can be seen even after storage for 6 months without refrigeration.

One has, according to the invention, a tube combining two different constituents that do not mix with one another even after multiple pressures on said tube, thus making it possible to apportion the two constituents regularly until complete emptying of the tube.

The rest of the description is given in reference to the examples.

Example 1

An aqueous phase of ketchup is prepared, with a yield point of 90 Pa and a viscosity of 18,000 cP and the following composition:

Tomato concentrate	17%
Vinegar	26%
Sugar	25.2%
Water	24%
Salt	2%
Thickener	5.7%
Spices	0.1%

This ketchup is pasteurized at 75°C for 10 min.

A mayonnaise is also prepared in a conventional manner; it has a yield point of 118 Pa and a viscosity of 18,500 cP and the following composition:

Sunflower oil	80%
Egg yolk	6%
Vinegar	10%
Spices	1%

Salt	1%
Water	2%

These two constituents are brought, using a very sanitary system, to an apportioning nozzle which fills a normal tube in a proportion of 200 g per constituent. A tube is obtained with a good simultaneity of apportionment of the two constituents, without any mixing of said constituents.

Example 2

The ketchup composition of the preceding example, pasteurized as in the preceding, is used again.

Furthermore, an oily phase is prepared containing

15% mayonnaise (according to Example 1)

2.7% thickener and

82.3% mild mustard.

These two constituents are introduced into a sanitary filling system, and the tubes are filled with a special nozzle.

In this case also, one obtains a system with two constituents that remain well separated even after 6 months of storage.

The package according to the invention therefore enables one to make available to the consumer a product with a long shelf life obtained by conventional methods, in compliance only with certain physical, chemical or physicochemical parameters, making possible the co-habitation of different constituents in a conventional tube.

Claims

1. An assembly for a food product entailing a tube containing a product with at least two different constituents, characterized by the fact that the tube is a normal tube, and by the fact that the constituents are distributed around the axis of symmetry of the tube in an alternating manner with each constituent [extending] over the whole length of said tube.

2. An assembly according to Claim 1, characterized by the fact that it contains two constituents which are mayonnaise and ketchup.

3. An assembly according to Claim 1, characterized by the fact that it contains two constituents which are mustard and ketchup.

4. An assembly according to Claim [illegible], characterized by the fact that the mustard and/or the ketchup contain a maximum of 40% oil.

5. An assembly according to one of Claims 1-4, characterized by the fact that the two constituents are in approximately equal quantities.

6. An assembly according to one of Claims 1-6 [sic], characterized by the fact that each constituent is present in two zones.

7. An assembly according to one of Claims 1-6, characterized by the fact that the yield point of the mayonnaise is between 100 and 140 Pa and that of the ketchup and mustard is between 60 and 120 Pa.

8. An assembly according to one of Claims 1-7, characterized by the fact that the viscosity of the mayonnaise is between 16,000 and 25,000 cP and that of the ketchup and mustard is between 12,000 and 22,000 cP.

9. An assembly according to one of Claims 1, 2 and 5-8, characterized by the fact that the oil content of the mayonnaise is between 70 and 80%.

10. An assembly according to one of Claims 1-9, characterized by the fact that the ketchup and mustard contain between 2 and 8% thickener.

11. An assembly according to one of Claims 1-10, characterized by the fact that the thickener is modified starch.

12. An assembly according to one of Claims 1-11, characterized by the fact that the mayonnaise, the ketchup and the mustard have a pH between 3.4 and 4.

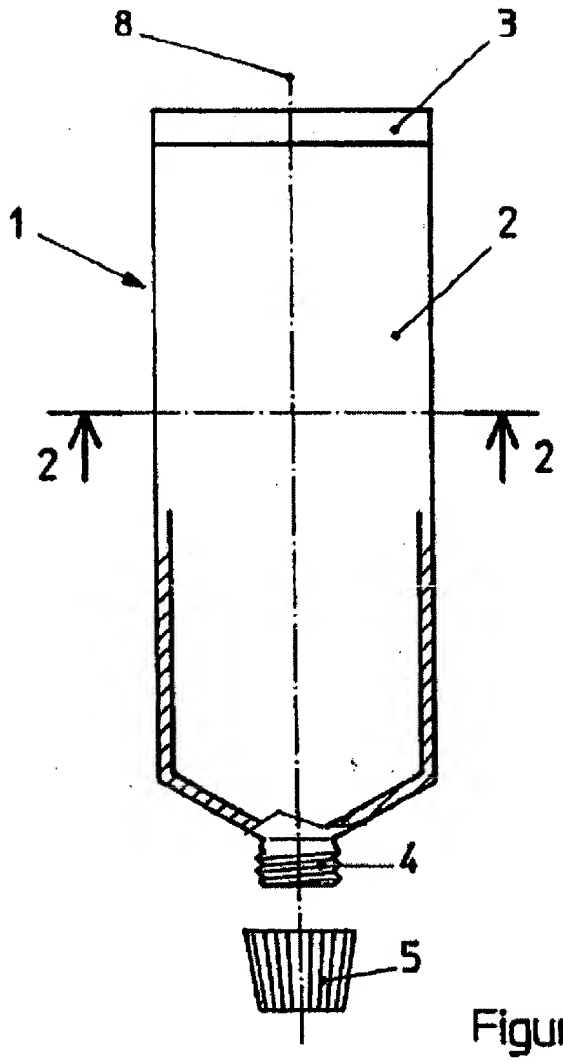

Figure 1

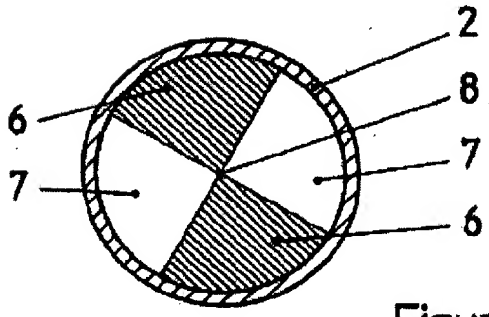

Figure 2

European Patent Office

Application Number EP 94 10 5157

EUROPEAN SEARCH REPORT

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.6)
Y,D	CH-A-670 612 (NAEF) * page 2, left column, line 27 – right column, line 51; figure 1 * ---	1-3,5,6	B65D1/00 B65D35/24 B65D77/08 A23L1/225
Y	FR-A-2 248 023 (HENKEL & CIE.) * page 2, line 2 – line 6 * * page 3, line 23 – page 4, line 13; figures 1-6 * ---	1-3,5,6	A23L1/24
A	WO-A-92 12911 (L'OREAL) * figure 5 * ---	1	
A	EP-A-0 243 321 (BIOTECH S.A.) * figures 1, 2 * ---	1	
A	GB-A-1 583 351 (GENERAL FOODS LTD.) * page 3, line 40 – line 83; figures 1-2B * ---	1	
A	EP-A-0 546 215 (SOC. DES PRODUITS NESTLE) * claim 1 * -----	7,9	
			TECHNICAL FIELDS SEARCHED (Int. Cl.6) B65D A23L
The present search report has been drawn up for all claims.			

Place of search	Date of completion of the search	Examiner
THE HAGUE	September 21, 1994	Berrington, N

CATEGORY OF CITED DOCUMENTS

X: Particularly relevant if taken alone.
Y: Particularly relevant if combined with another document of the same category.
A: Technological background.
O: Non-written disclosure.
P: Intermediate document.

T: Theory or principle underlying the invention.
E: Earlier patent document, but published on, or after the filing date.
D: Document cited in the application.
L: Document cited for other reasons.

.....

&: Member of the same patent family, corresponding document.

PTO 08-0075

CC = JP
19840220
Kokai
59031677

GP CORP JP 59-31677

SPREAD FOOD AND ITS MANUFACTURING METHOD
[Spread shokuhin to sono seizo hoho]

Joki Yamada

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. OCTOBER 2007
TRANSLATED BY: THE MCELROY TRANSLATION COMPANY

PUBLICATION COUNTRY	(19):	JP
DOCUMENT NUMBER	(11):	59031677
DOCUMENT KIND	(12):	Kokai
PUBLICATION DATE	(43):	19840220
APPLICATION NUMBER	(21):	57142101
APPLICATION DATE	(22):	19820818
INTERNATIONAL CLASSIFICATION[3]	(51):	A 23 L 1/38; A 23 G 1/00
INVENTOR	(72):	Joki Yamada
APPLICANT	(71):	Kewpie Co., Ltd.
TITLE	(54):	SPREAD FOOD AND ITS MANUFACTURING METHOD
FOREIGN TITLE	[54A]:	Spread shokuhin to sono seizo hoho

Claims

1. A spread food formed by filling of peanut butter and chocolate spread in multiple layers in a state without showing an irregular concave-convex shape for the boundary line of the two layers in a vessel.

2. The method for the manufacture of said spread food, characterized by the fact that peanut butter with a viscosity of about 50,000 to 150,000 cps during filling and chocolate spread of about 100,000 to 200,000 cps are filled in multiple layers in a vessel.

Detailed explanation of the invention

The present invention relates to a novel spread food and a method for its manufacture.

Peanut butter and chocolate spread are the materials widely known in general as spread foods for eating by spread coating on bread or the like. Even by eating both together, the sense of incongruity in taste is relatively small. Thus, if both are charged in a layer form without blending in a container beforehand, there is an advantage in which the inconvenience of removing both individually from containers during usage is eliminated. However, as a charging method for this purpose, a method is adopted in which, in general, at the bottom of a certain container having an opening section at the top, charging nozzles having two types of discharging holes arranged in an alternating radial form for use in peanut butter and chocolate spread and faced downward are inserted, and charging is completed while the nozzles are being removed in sequence together with the beginning of charging. However, there is a problem in which, if peanut butter and chocolate spread are charged with the nozzles mentioned above into a transparent container made of glass or the like, the boundary line of the two shows an irregular concave-convex shape because of the poor contact between the two, and the appearance is not very good. Thus, the product with the boundary line of the two being close to a relatively straight line has not been marketed.

The objective of the present invention is to provide a novel spread food in which peanut butter and chocolate spread are charged in a layer form into a container and the boundary line of the two does not show an irregular concave-convex shape, and its manufacturing method. As a result of a variety of experimental investigations in order to achieve the objective mentioned above, the present inventor has discovered that, by specifying the viscosities of both during charging in constant ranges, the objective of the present invention can achieved finally and the present invention is thus accomplished.

In other words, the present invention consists of a spread food formed by filling peanut butter and chocolate spread in multiple layers in a state without showing an irregular concave-convex shape for the boundary line of the two layers in a vessel, as well as a method for the manufacture of the spread food characterized by the fact that peanut butter with a viscosity of about 50,000 to 150,000 cps during filling and chocolate spread of about 100,000 to 200,000 cps are filled in multiple layers in a vessel.

The present invention will be explained in detail.

In the present invention, the peanut butter refers to a pasty food by adding a shortening, seasoning materials (table salt, sucrose and so on) into roasted, powder or crushed peanuts (peanut paste) followed by blending. In general, it is an oily food that has a water content of 1-2% or at most 4-5%. Furthermore, the chocolate spread refers to a pasty food showing a chocolate color and a cacao flavor by containing a few % (generally at least 2%) of cacao component (cacao mass powder, cocoa butter or cocoa) and having a sweet flavor by containing a sweetening material (sucrose, glucose or the like). Preferably, there are a case in which mainly powdered milk, oil and fat (in general, hardened oil, shortening, and other ambient temperature solid fats), an emulsifying agent and so on are added to yield an oily food with a relatively low water content, and a case in which syrup or the like is used and added in mainly pasted starch or a sweetening component to yield a water-based food with a relatively high water content. In the case of having the chocolate spread as the oily food, there is an advantage in which

during the storage of the product, the color change of peanut butter due to the shifting of the water inside the chocolate spread layer in the peanut butter layer is inhibited. The peanut butter and the chocolate spread (including both the oily and water-based materials) mentioned above are charged in multiple layers in the container in a state in which the boundary line of the two layers shows an irregular concave-convex shape. Here, the state in which the boundary line of the two layers shows an irregular concave-convex shape, in the case in which the peanut butter and the chocolate spread are charged in multiple layers from the bottom of the transparent container to the opening section by using multiple hole nozzles, refers to a state in which the boundary line appearing on the inside wall of the container in the central portion, excluding the charging initial end (generally the bottom of the container) where the line is somewhat distorted and the charging terminating end (generally the opening section of the container), is only one even if the concave section or the convex section seen from the direction perpendicular to the line is in the range of about 5 cm in length, or if when it is two or more, a state in which it is provided with any of the repeating characteristics of the concave-convex shape on the same boundary line and similar characteristics in the relationship with the adjacent boundary line. These states occur when the flow of the boundary line can be virtually controlled during the charging. Thus, in a length of about 5 cm of the boundary line of both layers, when the concave section or the convex section is only one, the boundary line is close to a straight line or a slow curve (due to one concave section or convex section) in one direction only. When there are numerous layers, they will be, for example, smooth longitudinal stripes, oblique stripes or spiral stripes. Furthermore, if the concave section or the convex section is two or more, when there are repeating characteristics on the same line, or when there is a shape similar to the adjacent boundary line even without repeating characteristics on the same line, it will be a pattern with a constant rhythm feeling. What is shown in Figure 1 is an example of a case

showing the irregular concave-convex shape of the boundary line. Furthermore, what is shown in Figure 2 is an example of a case not showing the irregular concave-convex shape (virtually a straight line).

In the diagrams, (1) is the transparent container, (2) is its cap. (3) and (4) are chocolate spread and peanut butter charged in multiple layers in the containers, and (5) is the boundary line of the two layers.

The containers that can be used in the present invention are generally those whose shapes can be fixed. However, it is also acceptable to use containers without fixed shape characteristics. Furthermore, the provision of the transparency of the container is preferred because the boundary line pattern can be enjoyed from the outside of the containers. Those without the provision of the transparency are also acceptable. In this case, when the spread food is scooped from the container with a spoon or the like, the cross-sectional pattern of the layers or the like can be enjoyed. Two or more layers are acceptable. If the number of layers is increased, one layer's width will be narrowed and this will become a stripe pattern. The direction of the layer is generally in the longitudinal direction or the diagonal direction. However, the horizontal direction is also acceptable.

In the manufacture of the spread food of the present invention described above, it is acceptable to charge the peanut butter with a viscosity of about 50,000 to 150,000 cps during filling and chocolate spread of about 100,000 to 200,000 cps in multiple layers in a container. If the viscosity of the peanut butter is less than about 50,000 cps or the viscosity of the chocolate spread is less than about 100,000 cps, as well as if the viscosity of the peanut butter is more than about 150,000 cps or the viscosity of the chocolate spread is more than about 200,000 cps, the close contact of the peanut butter and the chocolate spread will be poor and, as a result, the boundary line of the two layers will show an irregular concave-convex shape. The adjustment of the viscosities of the two can be achieved by the selection of the raw materials and the adjustment of blending or by the adjustment of the product temperature during charging. In general, if the product temperature is decreased during charging, the viscosity will increase

drastically. If the product temperature is increased during charging, the viscosity will decrease drastically. In charging the peanut butter and the chocolate spread in multiple layers into the container, for example, it is acceptable that multiple-hole nozzles with at least one each of the discharging hole for peanut butter and the discharging hole for chocolate spread opened downward are inserted in the vicinity of the bottom inside the container and removed in sequence from the container while the charging is being carried out. If the removing direction is vertically upward, the layer, and thus the boundary line, will be in the longitudinal direction. If it is in the diagonally upward direction, the layer and the boundary line will be in the diagonally upward direction. Furthermore, if a constant normal and reverse rotation is rendered to the nozzle together with having the vertically upward direction, the boundary line forms a meandering pattern having the repeating characteristics of the concave-convex shape.

Thus, with the spread food of the present invention, the appearance is good, and the layered food consisting of peanut better and chocolate spread can be enjoyed. Furthermore, according to the method for the manufacture of the spread food of the present invention, by the adjustment range of the viscosities of both, the desired food can be manufactured.

During the manufacturing of this spread food, if the sweetening material of peanut butter is set in the range of 0-5% in the raw material calculated as the sweetness of sucrose and table salt at 0.5-1.5%, as well as the sweetening material of chocolate spread in the range of 25-45% in the raw material calculated as the sweetness of sucrose, the harmonization in the taste of peanut butter and chocolate spread is also good.

Next, the test examples showing the effectiveness of the present invention and the application examples of the present invention will be explained.

Test examples

In a glass circular cylindrical container (inside diameter about 6 cm and height about 8 cm), nozzles having a total of 12 discharging holes consisting of six for peanut butter and six for chocolate spread were inserted and charging was started. While charging was being carried out, in sequence, the nozzles were removed vertically so that a total of 200 g including 100 g of peanut butter and 100 g of chocolate spread were charged into the container.

(A) At this time, the viscosity of the chocolate spread during charging was constant at 150,000 cps (20°C). Charging was carried out by changing the viscosity of the peanut butter during charging by changing the product temperature. The situations of the boundary lines of the two layers were observed. The results are shown in Table 1.

Table 1

(Unit of viscosity: 10,000 cps)

ピーナッツバターの粘度	1	3	5	7.5	10	12.5	15	17	20	25	30
境界線の状況	×	×	○	◎	◎	◎	○	×	×	×	×

Key: 1 Viscosity of peanut butter

2 Situation of the boundary line

(B) Then, the viscosity of the peanut butter during charging was constant at 100,000 cps (20°C). Charging was carried out by changing the viscosity of the chocolate spread during charging by changing the product temperature. The situations of the boundary lines of the two layers were observed. The results are shown in Table 2.

Table 2

チョコレートスプレッドの粘度	3	5	8	10	12.5	15	17.5	20	22	25	27	30
境界線の状況	×	×	×	○	◎	◎	◎	⊙	×	×	×	×

Key: 1 Viscosity of chocolate spread

2 Situation of the boundary line

Footnote (1): In the tables, ◎, O and X show the following.

◎: In the length of about 5 cm of the central section excluding the top end section and the bottom section of the container, the lines are virtually free from concave-convex shapes and they are essentially in a straight line shape.

O: In the length of about 5 cm identical to that described above, there is a slight concave section or convex section.

X: In the length of about 5 cm identical to that described above, there are two or more concave sections or convex sections. Any repeating characteristics in the shape on the same boundary line and similarity of adjacent boundary lines is not observed.

(2) As peanut butter and chocolate spread, those obtained by blending of the following raw materials were used.

A. Peanut butter

Peanut paste	83.0 (unit %)
Shortening	9.9
Glucose	4.0
Table salt	1.0
Fatty acid monoglyceride	2.1
Total	100.0 (%)

B. Chocolate spread

Cacao mass	7.0
Sucrose	36.0
Powder milk	22.0
Palm oil	34.4
Lecithin	0.5
Vanilla essence	0.1
Total	100.0 (%)

(3) As the charging nozzles, those arranged in a radial form so that 12 discharging holes with a diameter of about 3 cm, a width of 3 mm from the lower end outside and a length of 5 mm (the height in the radial direction) for the peanut butter use and the chocolate spread use were alternately equally separated.

From the tables given above, it is understood that, in order to have the boundary line not show the irregular concave-convex shape when peanut butter and chocolate spread are charged in multiple layers,

it is necessary that the viscosity during charging be about 50,000 to 150,000 cps for peanut butter and about 100,000 to 200,000 cps for chocolate spread.

Application Example 1

A multilayer spread food was manufactured under the same conditions as those in the test examples except that the raw material blending of the chocolate spread was changed to that given in the following, and its viscosity during charging was constant at 150,000 cps and its viscosity during charging of the peanut butter was constant at 100,000 cps. The boundary lines of the layers of this material were virtually in a straight line shape.

Raw material blending of the chocolate spread (unit %)

Cacao mass	7.0	Shortening	10.0
Millet jelly	35.0	Xanthan gum	0.3
Glucose	5.0	Lecithin	0.3
Powder milk	23.0	Table salt	0.2
A-Starch	2.8	Fresh water	16.4
Total			100.0 (%)

Application Example 2

During charging while the charging nozzles were being removed in Application Example 1, a slow clockwise rotation was rendered to the nozzles with their axial cores as the center. As a result, a multilayer spread food with the boundary lines of the peanut butter and the chocolate spread showing a

spiral shape was obtained. In this case, the irregular concave-convex shape was not observed in the boundary lines mentioned above.

Application Example 3

During charging while the charging nozzles were being removed in Application Example 1, a normal and reverse rotation was rendered to the nozzles. As a result, a multilayer spread food with the boundary lines of the peanut butter and the chocolate spread showing a wave pattern was obtained. This wave pattern was in a virtually completely similar shape for adjacent lines. It was a material with a rhythm feeling.

Brief explanation of the figures

The diagrams show virtually the actual dimensional sizes of the front view diagrams of the spread food by charging peanut butter and chocolate spread in multiple layers in the longitudinal direction in a glass container. Among these, Figure 1 shows the conventional example, and Figure 2 shows the application example of the present invention.

1 ... Container, 2 ... Cap, 3 ... Chocolate spread, 4 ... Peanut butter, 5 ... Boundary line

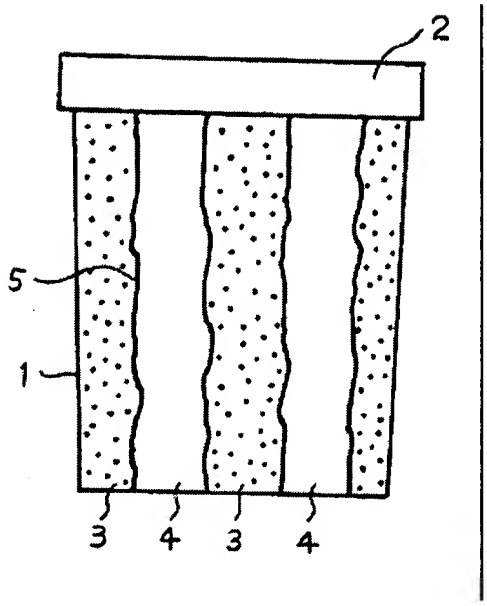

Figure 1

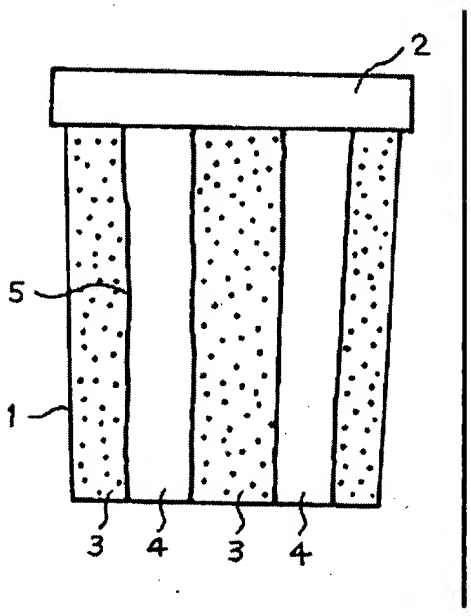

Figure 2

PTO 01-4145

Japanese Kokai Patent Application No.
Sho 61[1986]-100174

QP CORP JP 61-100174

SPREADABLE FOOD AND ITS MANUFACTURING METHOD

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UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. SEPTEMBER 2001

TRANSLATED BY THE RALPH MCELROY TRANSLATION COMPANY

JAPANESE PATENT OFFICE
PATENT JOURNAL (A)
KOKAI PATENT APPLICATION NO. SHO 61[1986]-100174

Int. Cl.[4]:	A 23 L 1/38 A 23 D 5/00
Sequence Nos. for Office Use:	8412-4B Z-7421-4B
Filing No.:	Sho 59[1984]-219392
Filing Date:	October 20, 1984
Publication Date:	May 19, 1986
No. of Inventions:	1 (Total of 5 pages)
Examination Request:	Not filed

SPREADABLE FOOD AND ITS MANUFACTURING METHOD

[Spread shokuhin to sono seizo hoho]

Inventor: Tsuneki Yamada

Applicant: Cupee K.K.

[There are no amendments to this patent.]

Claims

1. A spreadable food created by filling a container with peanut butter and another oily spread in multiple layers such that the boundary line of both layers does not display irregular indentations.

2. A manufacturing method for a spreadable food characterized by filling a container with peanut butter at a viscosity at filling of about 50,000-150,000 cps and another oily spread of

about 100,000-200,000 cps in multiple layers.

Industrial application field

This invention concerns a new spreadable food and its manufacturing method.

Prior art

Peanut butter and other oily spreads, such as white cream, which is a mixture of powdered milk, fat, and sugar, for example, are widely known to the public as spreadable food products that are respectively spread on bread, for example, and enjoyed. The strangeness of flavor is relatively small when both are eaten together, and the respective flavors also can be enjoyed. Therefore, if both are packed into one container beforehand in layers without being mixed together, the inconvenience of removing them separately from respective containers when using them can be eliminated, which is convenient.

Problems to be solved by the invention

As a filling method for this purpose, a method is used in which a filling nozzle, in which discharge holes for both peanut butter and another oily spread are alternately arranged radially and face downwards, is inserted into the bottom of a container generally with an opening at the top part, and filling is completed while successively withdrawing the nozzle from the container as filling begins. However, when peanut butter and another oily spread fill a clear container made of glass, for example, by the aforementioned nozzle, possibly due to a poor conformity between both, there is the problem of the boundary line of both displaying irregular indentations, and the outer appearance is poor. Accordingly, a product in which the boundary line between both is relatively close to a straight line has not been distributed in the market yet.

The purpose of this invention is to offer a new spreadable food and its manufacturing method, in which peanut butter and another oily spread fill a container in layers, and moreover, the boundary line between both does not display irregular indentations. As a result of the examination of various types of tests for attaining the aforementioned purpose, the inventor of this invention has acknowledged that this purpose can be attained by establishing the respective viscosities of both at filling at a specific range, and has finally completed this invention.

Means to solve the problems

More precisely, this invention consists of a spreadable food created by filling a container with peanut butter and another oily spread in multiple layers such that irregular indentations are not displayed at the boundary line of both layers, and a manufacturing method for the spreadable food is characterized by filling a container with peanut butter at a viscosity at filling of about 50,000-150,000 cps and another oily spread of about 100,000-200,000 cps.

This invention will be explained in detail below.

Peanut butter in this invention refers to paste form food products in which roasted and crushed peanuts (peanut paste) are added and mixed together with shortening, seasoning (salt and sugar, for example), and an emulsifier, for example, generally oily food products and oily spreads with a water content of 1-2%, 4-5% at the most. Also, other oily spreads refer to paste form food products having a sweet taste by mainly containing fats and sweeteners (sugar and glucose, for example) and from which peanut butter is removed. According to preference, powdered milk, and emulsifiers, for example, are primarily added. Sweeteners, for example, are present in a dispersed form in the phase of fats, and above all it is an oily food product with a relatively small amount of water content. Those having a cacao content (cacao powder, cocoa butter or cocoa) are

eliminated from the oily spread in this invention. The flavor is strongly affected when it contains cacao, and the unique flavor of peanut butter becomes very poor. Fats include creams and animal and vegetable fats, and their kinds are not restricted. In the spreadable food in this invention, the aforementioned peanut butter and another oily spread fill a container in multiple layers in a condition that does not display irregular indentations at the boundary line of both layers. The condition that does not display irregular indentations at the boundary line of both layers here refers to the condition of the boundary line which appears on the inner wall of the container in the central area eliminating the fill-up starting end (generally the bottom part of the container) and the fill-up finishing end (generally the opening part of the container) where the lines slightly tend to distort when filling a clear container with peanut butter and another oil spread in multiple layers from the bottom area to the opening area by using a multiple-hole nozzle, in which the indentation, if it is there, is only one in a range of about 5 cm in length when viewed from the direction orthogonal to the line, or such that, if there are 2 or more, the shape of the indentation is caused by either repeatability over the same boundary line or the similarity in relation to the boundary lines that are adjacent to each other. These conditions are formed when the flow of the boundary line at filling can be pracically controlled. Accordingly, when the number of indentations is one or less over a length of about 5 cm of the boundary line of both layers, the boundary line is nearly a straight line, or forms a slow curve in one direction (accordingly one recessed area or one projecting area), forming smooth vertical lines, diagonal lines, and spiral lines, for example, when there are many layers. Furthermore, when there are 2 or more indentations, and there is repeatability over the same shaft, or when there is similarity between adjacent boundary lines although there is no repeatability over the same boundary line, a pattern with a constant rhythmic feel is formed. Figure 1 shows an example where the boundary lines

display irregular indentations. Figure 2 also shows an example that does not display irregular indentations (nearly straight lines).

In the figures, (1) is a clear container, (2) is its cap, (3) and (4) are an oily spread and peanut butter that respectively fill the container in multiple layers, and (5) is the boundary line between layers.

Containers that are used in this invention generally are those that have fixed shapes, but containers without fixed shapes also may be used. Also, it is desirable for the container to be clear so that the pattern of the boundary lines can be appreciated from the outside of the container, but those that are not clear can also be used. In this case, the cross-sectional pattern of the layers can be appreciated when scooping out the spreadable food from the container with a spoon, etc. Multiple layers indicate that there are at least 2 layers, and a stripe pattern is obtained when the number of layers increases and the width of one layer is narrow. The direction of the layers generally is vertical or diagonal, but horizontal layers are also acceptable.

In order to manufacture the spreadable food in this invention described above, a container may be filled with peanut butter at a viscosity at filling of about 50,000-150,000 cps and another oily spread at about 100,000-200,000 cps in many layers, because the boundary line of both layers displays irregular indentations probably resulting from poor conformity between the peanut butter and the oily spread when the viscosity of the peanut butter is lower than about 50,000 cps or when the viscosity of other oily spread is lower than 100,000 cps, or furthermore, when the viscosity of the peanut butter exceeds about 150,000 cps, or the viscosity of other oily spread exceeds about 200,000 cps. The viscosities of both may be adjusted through the selection and mixture of the materials or an adjustment of the temperature at filling. Generally, the viscosity dramatically increases when the temperature at filling is decreased, and the viscosity

dramatically decreases when the temperature is increased. When filling a container with the peanut butter and another oily spread in multiple layers, a multiple-nozzle, in which at least one or more discharge holes for peanut butter and discharge holes for another oily spread, for example, respectively open up and down, may be inserted near the bottom area of the container, and successively extracted from the container while filling. When the extraction direction is vertically upwards, the layers, and accordingly the boundary lines, are in a vertical direction, and the layers and boundary lines are directed diagonally upwards when they extraction direction is diagonally upwards. Furthermore, when a certain reciprocal rotation is given to the nozzle in the vertically upward direction, the shape of the indentations of the boundary line form a zigzag pattern with repeatability.

Effect of the invention

As above, through the spreadable food in this invention, a layered food product consisting of peanut butter and another oily spread having a nice outer appearance can be enjoyed. Also, the spread which forms a layer adjacent to the peanut butter is oily and has a small water content in the spreadable food product in this invention; therefore, this water content during storage of the product does not shift towards the peanut butter side and does not discolor the bright peanut butter color to a darker color. Furthermore, through the manufacturing method of the spreadable food in this invention, the intended food product can be easily manufactured through adjusting the viscosities of both.

At the manufacture of this spreadable food, a satisfactory balance in taste between the peanut butter and the oily spread can be obtained when the sweetener in the sugar-sweetened peanut butter is within respective ranges of 0-5% in the ingredients and 0.5-1.5% for salt, and

when the sweetener in the oily spread converted as sugar is within a range of 25-45% in the materials.

Next, a test example showing the effect of this invention will be explained.

Test example

Filling began by inserting a nozzle with a total of 12 discharge holes attached consisting of 6 holes for peanut butter and 6 holes for another oily spread into a glass cylindrical container (inner diameter of about 6 cm, and height of about 8 cm), and a total of 200 g, including 100 g of peanut butter and 100 g of another oily spread, filled the container while vertically extracting the nozzle while filling.

(A) During this, the viscosity at filling of the oily spread was constant at 150,000 cps (20EC), and the viscosity at filling of the peanut butter changed variously by changing the temperature, and Table 1 shows the conditions of the boundary line of both layers which were formed while filling and observed.

Table 1

Keys: 1 (Unit of viscosity: 10,000 cps)
2 Viscosity of the peanut butter
3 Conditions of the boundary line

(B) Also, establishing a constant viscosity when filling the peanut butter to 100,000 cps (20EC), the viscosity when filling the oily spread was changed variously by changing the temperature, and Table 2 shows the conditions of the boundary line of both layers which were formed while filling and observed.

Table 2

Keys: 1 Viscosity of the oily spread
2 Conditions of the boundary line

Note (1): _, Φ, and X marks in the table indicate the following.

_: In about 5 cm length in the central area except for the upper edge and lower edge sides of the container, the line is almost straight with almost no indentations.

Φ: In the same 5 cm length as above, there is one minor recessed area or projecting area.

X: In the same 5 cm length as above, there are 2 or more indentations, and neither repeatability in shape over the same boundary line nor similarity with the adjacent boundary line are observed.

(2): Peanut butter and another oily spread with the mixture of the ingredients below were used.

(A) Peanut butter

Peanut paste	83.0 (Unit %)
Shortening	9.9
Glucose	4.0
Salt	1.0
Fatty acid monoglyceride	2.1
Total	100.0 (%)

(B) Other oily spread

Vegetable fat	50.0
Milk fat	7.0
Sugar	25.0
Lactose	5.0
Whole fat powdered milk	13.0
Lecithin	0.5
Vanilla essence	0.1
Total	100.0 (%)

(3): As the filling nozzle, one was used with a diameter of about 3 cm and 12 discharge holes for peanut butter and another oily spread with 3 mm width and 5 mm length (length in the

radial direction) alternately arranged radially near the outer side at the lower edge at an equal distance.

From the aforementioned table, it can be understood that the viscosity for peanut butter at filling 50,000-150,000 cps is necessary and about 100,000-200,000 cps for the oily spread, so that the boundary line when filling the peanut butter and the oily spread in multiple layers does not display irregular indentations.

Application examples

Application Example 1

A multilayered spreadable food product was manufactured under the same conditions as in the test example except for changing the mixture of the materials of oily spread to those listed below, establishing a constant viscosity during the filling of 150,000 cps, and establishing a constant viscosity when filling the peanut butter of 100,000 cps. The boundary line of the layers of this type also showed a near straight line.

Mixture of the materials of another oily spread (unit %)	
Shortening	45.0
Milk fat	12.0
Sugar	20.0
Lactose	10.0
Lecithin	0.3
Salt	0.2
Whole fat powdered milk	12.5

Total	100.0 (%)

Application Example 2

When a gentle right-handed rotation centering around the shaft core was provided to the nozzle when filling while extracting the filling nozzle in Application Example 1, a spreadable food product in multiple layers displaying a spiral boundary line between the peanut butter and another oily spread was obtained, and no irregular indentations were observed in the aforementioned boundary line in that case.

Application Example 3

When a reciprocal rotation was provided to the nozzle when filling while extracting the filling nozzle in Application Example 1, a spreadable food product in multiple layers displaying a wavy boundary line pattern between peanut butter and another oily spread was obtained, all of the wavy patterns that are adjacent were almost similar and had a rhythmical feel.

Brief description of the figures

The diagrams show the front views of the spreadable food product in which a glass container is filled with peanut butter and another oily spread in multiple layers in the vertical direction in almost the actual sizes. Figure 1 shows a conventional example, and Figure 2 shows an application example of this invention.

1∃∃∃Container, 2∃∃∃cap, 3∃∃∃another oily spread, 4∃∃∃peanut butter, and 5∃∃∃boundary line.

Figure 1

Keys:
1 Container
2 Cap
3 Oily spread
4 Peanut butter

5 Boundary line

Figure 2

PTO 08-0072

CC = JP
19870515
Kokai
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HOASHI JP 62-104566

METHOD FOR MANUFACTURING A COMPLEX FOOD PRODUCT
[Fukugo shokuhin no seizo hoho]

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UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. OCTOBER 2007
TRANSLATED BY: THE MCELROY TRANSLATION COMPANY

PUBLICATION COUNTRY	(19):	JP
DOCUMENT NUMBER	(11):	62104566
DOCUMENT KIND	(12):	Kokai
PUBLICATION DATE	(43):	19870515
APPLICATION NUMBER	(21):	60245431
APPLICATION DATE	(22):	19851101
INTERNATIONAL CLASSIFICATION	(51):	A 23 L 1/31
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TITLE	(54):	METHOD FOR MANUFACTURING A COMPLEX FOOD PRODUCT
FOREIGN TITLE	[54A]:	Fukugo shokuhin no seizo hoho

Claim

A method for manufacturing a complex food product, characterized by the fact that a domestic animal meat paste and jelly are extruded and molded as a unit, packed into a container, and subjected to heat treatment.

Technical field of the invention

The present invention pertains to a method for manufacturing a complex food product, in which a jelly and a paste of domestic animal meat are combined.

Prior art and problems to be solved by the invention

Conventionally, processed foods using domestic animal meat such as sausages and hams, for example, have been known. Sausages and hams are prepared by salting down the raw meat, grinding it, packing it in a casing, smoking it as necessary, and then cooking it (heat treatment). When sausages and hams are to be prepared for eating, they may be served as is, or thinly sliced and served, or they may subjected to heat treatment such as by frying or sauteeing, either as they are or cut into suitable shapes, and then served up for eating.

On the other hand, it is known that when meats are prepared for eating, various sauces may be used, among which one is known as jelly, such as consommé. These sauces are manufactured separately from the meat preparation for eating, being added to the meat preparation for eating at the time of eating, and then being eaten.

The present inventors have developed a complex food product, wherein a kneaded product of sausage or ham is molded in a vessel-shape, and a flavoring jelly is packed into its interior; and they have already submitted a utility model registration (Japanese Utility Model Application No. Sho

59[1984]-162198). This complex food product has the advantages of making it possible to eat a kneaded product, such as sausage or ham, at the same time as the flavoring jelly, as is, thus making it possible to conveniently taste the flavors of both.

Nevertheless, the molding of kneaded products such as sausage or ham in a vessel-shape is fraught with considerable difficulty, and it is a problem because it is unsuitable for mass production. Also, by attaching the flavoring jelly to the external circumference of the kneaded product rather than its interior, it becomes possible to taste a good flavor and also to offer changes to the appearance, but the problem of having the jelly attached to the external circumference is that the jelly flows away during the heat treatment.

Objective of the invention

The objective of the present invention is to offer a method for manufacturing a complex food product, being a convenient method for a complex food product, in which a jelly and a paste of domestic animal meat are combined, with good productivity, and which enables the jelly to be attached even to the outer circumference of the domestic animal meat.

Constitution of the invention

The invented method for manufacturing a complex food product is characterized by the fact that a domestic animal meat paste and jelly are extruded and molded as a unit, packed into a container, and subjected to heat treatment.

Because, in this way, a domestic animal meat paste and jelly are extruded and molded as a unit, it is possible to form various shapes with good productivity. And because they are packed into a container and subjected to heat treatment, it is possible to prevent the jelly from flowing away. Finally, the

complex food product obtained by the present invention can be stored, for example by refrigeration, and then taken out and conveniently eaten as it is.

In the present invention, the paste of domestic animal meat has as the main raw ingredient poultry meat, pork, beef, or mutton, for example, and as accessory raw ingredients, as necessary, fish, vegetable protein, or starch, for example, and additives may also be used such as spices, colorants, synthetic preservatives, and emulsion stabilizers, for example. It is also possible to add finely chopped vegetables such as bell pepper, green peas, and carrots, for example. The raw meat may be salted with table salt, niter, or sodium nitrite, for example, finely ground using a meat grinder, or cut with a silent cutter, thus giving a paste. This paste of domestic animal meat is then extruded and molded by the following processes.

As the jelly, something wherein a coagulant has been added to some kind of soup may be used, for example. Here, the kind of soup may be a corn cream soup, potage soup, stew, or Japanese miso soup, for example. The corn cream soup may be prepared, for example, by dissolving sweet corn powder, skimmed milk powder, table salt, sugar, flavorings, and spices in water, and adding provender as necessary, such as parsley, carrots, and the like, and heating this. The potage soup may be prepared by dissolving flour, mashed potatoes, starch, skimmed milk powder, table salt, sugar, flavorings, and spices in water, and adding provender such as mentioned above as necessary, and heating this. The stew may be prepared by dissolving starch, beef extract, curry powder, skimmed milk powder, table salt, sugar, flavorings, and spices in water, adding provender such as mentioned above as necessary, and adding butter oil and the like as necessary, and heating this. Miso soup may be prepared by boiling provender such as Undaria pinnatifida [wakame seaweed], green onions, shellfish, and Flammulina velutipes [golden needle mushroom], for example, in water, and flavoring this with miso and flavorings, for example. Separately, as the coagulant that is added to these kinds of soup, agar, gelatin, or pectin, for

example, is used. The jelly is then prepared by adding these coagulants to the aforementioned kind of soups. It is also possible to use mayonnaise sauce, for example, which has coagulant properties, as the jelly.

In the present invention, the jelly and paste of domestic animal meat obtained in this way are extruded and molded as a unit. More specifically, the paste of domestic animal meat and jelly are simultaneously extruded from different nozzles of an extrusion-molding device, conjoined together, and molded. It is preferred that the substance used as the jelly in this case be something in the form of a powder or thin slice, for example, that has been gelatinized. It is also possible for the shape of the entire molded article to be any shape, such as a rounded cylindrical shape or rectangular column shape, for example. It is also possible to have various modes wherein the paste of domestic animal meat layer and the jelly layer are in conjugated configurations. Then, after extrusion and molding, the molded article is packed into a container. Various things may be used as the container, such as a plastic container, paper container, metal container, plastic film, or edible film, for example, but the preferred modes are those that enable sealing to occur at the same time as the extrusion and molding. Next, after the molded article has been packed into a container, it is subjected to heat treatment. The heat treatment conditions will differ according to the thickness of the molded article, and the required storage period, but best results are obtained when the heating is such that the temperature of the core reaches the 70°C stage; for example it is preferred that heating be conducted at 70-80°C for 20-80 min. Due to the heating, the thermocoagulation proteins of the paste of domestic animal meat will undergo thermocoagulation, and the fats and moisture, for example will be enclosed within a reticular structure of protein granules. The jelly will undergo melting, but because it is packed into a container, it will not flow away. By cooling it in this condition, the jelly will again gelatinize, thus enabling a complex food product to be obtained.

This complex food product may be stored in a refrigerator, for example, and taken out at the necessary time and consumed as is.

Application examples of the invention

Figure 3 and Figure 4 show an example of the extrusion-molding device that is used in working the present invention. The extrusion-molding device 11 has a jelly supply device 12 and a domestic animal meat paste supply device 13. The devices 12 and 13 are each constituted with a mixer-kneader 15 with an attached hopper 14, and a gear pump 16. A pressurized feed pipe 17 is attached to each gear pump 16. A pair of screw vanes 18 and 18 that rotate freely is provided within each aforementioned mixer-kneader 15, such that the food product material inserted from hopper 14 into mixer-kneader 15 is mixed and kneaded with screw-rotation while it is being sent to gear pump 16. Inside gear pump 16, a pair of intermeshing gears 19 and 19 are furnished, such that, by rotating in the direction of the arrow, the various raw ingredients are sent under pressure to pressurized feed pipe 17. The pressurized feed pipes 17 are attached to nozzle 20. Nozzle 20 has a double cylinder structure: in the case of jelly supply device 12, the pressurized feed pipe 17 is connected to outer tube nozzle 21, and in the case of domestic animal meat supply device 13, the pressurized feed pipe 17 enters outer tube nozzle 21 from the side and becomes inner tube nozzle 22. The outer tube nozzle 21 is extended and formed in the direction of food product material extrusion, and its tip surface becomes extrusion port 21a, while the tip surface of inner tube nozzle 22 becomes extrusion port 22a. When the raw material sent from domestic animal meat supply device 13 is extruded from extrusion port 22a, it comes into contact, inside outer tube nozzle 21, with the raw material sent from jelly supply device 12 to the inside of outer tube nozzle 21.

Jelly is charged into jelly supply device 12 of the aforementioned extrusion-molding device 11, and paste of domestic animal meat is charged into domestic animal meat supply device 13. As the jelly that

may be used, for example, sweet corn powder, skimmed milk powder, table salt, sugar, flavorings, and spices are dissolved in water, to which parsley and carrots are added, and to which gelatin is also added, and then subjected to heat treatment. As the paste of domestic animal meat, a mixed substance may be used in which, for example, pork has been finely chopped and then salted using table salt, niter, and/or sodium nitrite, and with the addition of starch, vegetable protein, spices, colorants, synthetic preservatives, and emulsion stabilizer. The jelly is extruded from outer tube nozzle 21, the paste of domestic animal meat is extruded from inner tube nozzle 22, and both are conjugated into a unit. A cylindrical edible film comprising collagen has been previously attached to nozzle 20, the molded jelly and paste of domestic animal meat are filled into this edible film, and sealed by heat fusion at a predetermined location. Then this is immersed in hot water and subjected to heat treatment for 60 min at 80°C, and then allowed to cool, thus making it possible to obtain a complex food product.

Figure 1 and Figure 2 show a complex food product obtained by the aforementioned [method]. Specifically, the complex food product 31 forms overall a rounded rod, with a paste of domestic animal meat 32 provided in the axial core and a jelly part 33 provided around its circumference, which is in its turn covered by edible film 34 around its circumference. The paste of domestic animal meat 32 and the jelly part 33 have been solidified. The complex food product 31 may be refrigerated and preserved, for example, then suitably taken out and eaten as is. When eaten, the jelly part 33 will dissolve in the mouth, and blend with flavor of the paste of domestic animal meat 32, so as to be very delicious. By providing the jelly part 33 on the circumference, it is possible to obtain a taste sensation of rich variety.

After the jelly and paste of domestic animal meat have been extruded and molded, they may be packed into a plastic container or metal container, subjected to heat treatment, and then stored after being taken out of the container and repacked. It is also possible, after the jelly and paste of domestic

animal meat have been extruded and molded, for them to be packed into a plastic film bag, for example, and subjected to heat treatment, and then at the time of consumption to be taken from the bag and eaten.

Figure 5, Figure 6, Figure 7, and Figure 8 show yet other examples of the complex food product 31 obtained by the present invention. In the example in Figure 5, a shape is employed wherein the paste of domestic animal meat 32 and jelly part 33 are layered alternately. In the example in Figure 6, a shape is employed wherein the paste of domestic animal meat 32 has fan shapes in cross-section perpendicular to the direction of extrusion, which are positioned such that the intervals between them form a cross shape, and the jelly part 33 is brought into conjunction so as to surround these intervals and their circumferences. In the example in Figure 7, the paste of domestic animal meat 32 is positioned at predetermined intervals, so as to be arranged in a 3-layer form, and the jelly part 33 is brought into conjunction so as to surround these intervals and their circumferences. In the example in Figure 8, the paste of domestic animal meat 32 is shaped to form triangles in cross-section perpendicular to the direction of extrusion, and these are positioned at predetermined intervals, so as to be arranged in a square shape overall, and the jelly part 33 is brought into conjunction so as to surround these intervals and their circumferences.

Effect of the invention

As explained above, the present invention makes it possible to form a variety of shapes with good productivity, because a jelly and a paste of domestic animal meat are extruded and molded in one unit. Also, because this is packed into a container and subjected to heat treatment, it is possible to prevent the jelly from flowing away. The complex food product obtained by the present invention, when refrigerated and stored, for example, can be eaten conveniently by taking it out, and the flavor of the jelly blends with the flavor of the domestic animal meat, being very delicious. It is also possible to obtain a good

taste sensation with rich variety in the jelly, which is soft, and the domestic animal meat, which has elasticity.

Brief description of the figures

Figure 1 is a vertical cross section showing one example of a complex food product obtained according to the present invention. Figure 2 is a horizontal cross section of the same complex food product. Figure 3 is an oblique view showing one example of an extrusion-molding device that is used to work the present invention. Figure 4 is a cross section along the line IV-IV of Figure 3. Figure 5, Figure 6, Figure 7, and Figure 8 are oblique views, respectively showing complex food products obtained according to the present invention.

In the drawings, 11 represents the extrusion-molding device, 12 the jelly supply device, 13 the domestic animal meat supply device, 20 the nozzle, 21 the outer tube nozzle, 22 the inner tube nozzle, 31 the complex food product, 32 the paste of domestic animal meat, and 33 the jelly part.

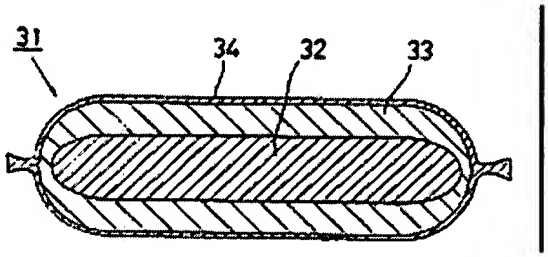

Figure 1

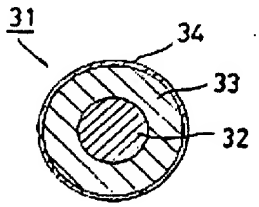

Figure 2

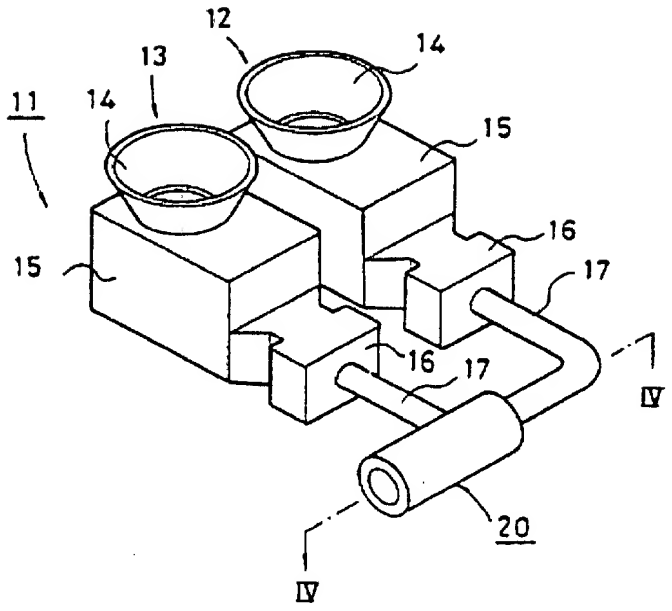

Figure 3

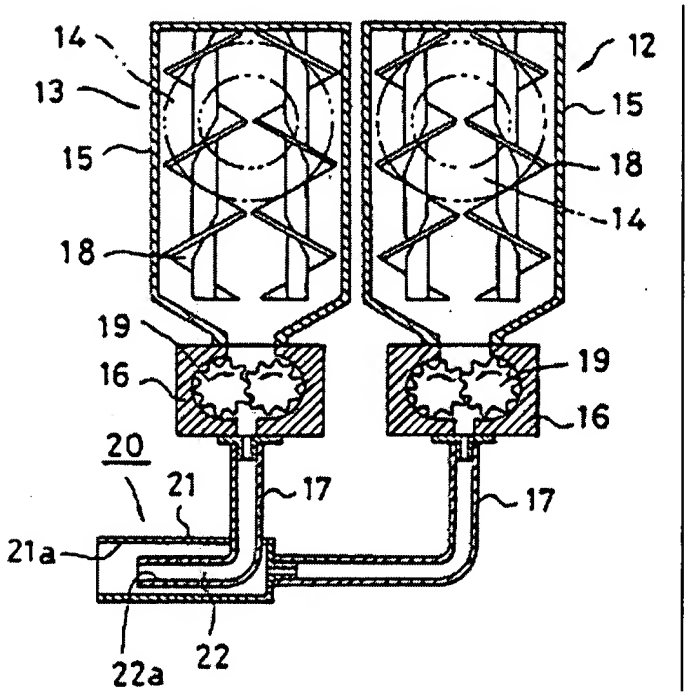

Figure 4

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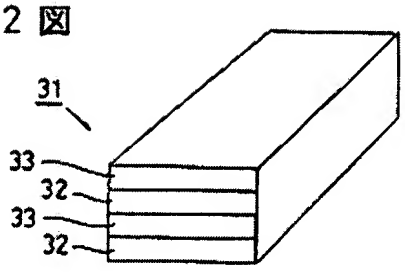

Figure 5

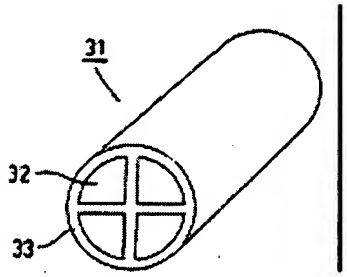

Figure 6

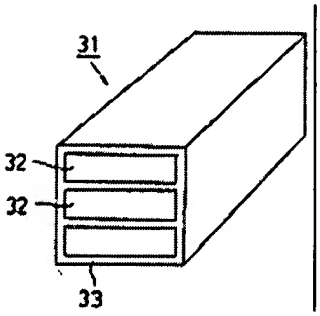

Figure 7

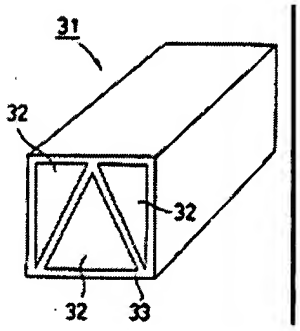

Figure 8

TWO-LAYER PROCESSED EGG IN STICK SHAPE AND PRODUCTION METHOD THEREOF

[Bojo niso kako tamago oyobi sono seizo hoho]

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UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. OCTOBER 2007
TRANSLATED BY: THE MCELROY TRANSLATION COMPANY

PUBLICATION COUNTRY	(19):	JP
DOCUMENT NUMBER	(11):	59159758
DOCUMENT KIND	(12):	Kokai
PUBLICATION DATE	(43):	19840910
APPLICATION NUMBER	(21):	5831740
APPLICATION DATE	(22):	19830301
INTERNATIONAL CLASSIFICATION[3]	(51):	A 23 L 1/32
INVENTOR	(72):	Honma Kazuo
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TITLE	(54):	TWO-LAYER PROCESSED EGG IN STICK SHAPE AND PRODUCTION METHOD THEREOF
FOREIGN TITLE	[54A]:	Bojo niso kako tamago oyobi sono seizo hoho

Claims

1. Two-layer processed egg in stick shape, characterized in that the outer layer is formed as a heat-coagulated layer of egg yolk solution incorporated with emulsifiers while the inner layer is formed as a heat-coagulated layer of egg white solution incorporated with emulsifiers.

2. A method for producing two-layer processed egg in stick shape, characterized in that a core is inserted in a cylinder and the egg yolk solution incorporated with emulsifiers is filled and heated in the space between said core and the cylinder wall while the egg white solution incorporated with emulsifiers is filled, heated and coagulated in the core when said core part is in cylinder shape or inside the heated and coagulated egg yolk solution by removing the core when said core is in stick shape, followed by removing said coagulated product from the cylinder .

Detailed description of the invention

This invention pertains to two-layer processed egg in stick shape consisting of an outer layer of coagulated egg yolk solution and an inner layer of coagulated egg white solution.

Various conventional methods are known for producing processed egg in a stick shape, but many problems remain with these methods for processing egg yolk. Japanese Kokai Patent Application No. Sho 51[1976]-40148 disclosed a method which consisted of mixing eggs with edible oils and emulsifying the entire raw materials, followed by filling the mixed substances in a synthetic resin bag and coagulating therein with heating. However, said production method requires manual labor for filling the raw materials in synthetic resin bags and heating the bags and coagulating the product after manually feeding the bags into a heating vessel, thus it is not suitable for large-scale production. Furthermore, there is no distinction of the inner layer and the outer layer and the method is not suitable for producing 2-layer processed eggs.

In this respect, a likely method suitable for large-scale production is heating an egg solution in a cylindrical container and removing the processed product afterward. However, such method is only suitable for producing processed eggs containing egg whites solely or with egg white as the outer layer, but is not suitable for processing egg yolk. The reason is that egg white contains a large quantity of water (about 80%) which allows the egg white to form an easily detachable product without deformation when being removed from the cylinder after heating/coagulating, but the outer layer consists of egg yolk /2* solely, the egg yolk sticks to the cylinder wall easily because it contains little water but a large quantity of protein. This makes it difficult to carry out detachment by extrusion, and if forceful extrusion is carried out, the shape of the coagulated egg yolk is deformed because of its fragility, thus losing its commercial value. A means that has been considered for solving the problem of detachment from the container is incorporating oils/fats, but simply adding oils/fats is not a sure way of solving the problem because the oils/fats added are easily released from the processed egg yolk and the appearance and taste are compromised.

Furthermore, good products of 2-layer processed eggs cannot be produced with egg joke in the outer layer and with egg white in the inner layer because egg white has poor thermal conductivity and is difficult to harden. Specifically, when egg white is utilized as the inner layer and coagulated therein with heating, the egg yolk as the outer layer browns rapidly from heating while the egg white is being heated, resulting in losing the commercial value of the product.

Due to the aforementioned reasons, currently there is no commercial product of 2-layer processed eggs with egg yolk as the outer layer and egg white as the inner layer.

The present invention successfully achieves a method for producing processed eggs with excellent detachment property from containers even after the egg yolk is processed and with excellent appearance and taste by improving the way oils/fats are added, and said method is applied to producing the

* [Numbers in right margin indicate pagination of the original text.]

aforementioned 2-layer processed eggs. The constitution is characterized in that the outer layer is formed as a heat-coagulated layer of egg yolk solution incorporated with emulsifiers while the inner layer is formed as a heat-coagulated layer of egg white solution incorporated with emulsifiers; and the method is characterized in that a core in inserted in a cylinder and the egg yolk solution incorporated with emulsifiers is filled and heated in the space between said core and the cylinder wall while the egg white solution incorporated with emulsifiers is filled, heated and coagulated in the core when said core is in cylinder shape or inside the heated and coagulated egg yolk solution by removing the core when said core is in stick shape, followed by removing said coagulated product from the cylinder .

The present invention is further described in detail using the following application examples.

In the present invention, heat-coagulated layer 10 of egg yolk solution containing emulsifiers is first formed as the outer layer of the 2-layer processed egg, as shown in Figure 7 and Figure 8. In this case, the egg yolk solution incorporated with emulsifiers denotes a substance prepared by first producing a homogeneous mixture from blending and emulsifying oils/fats with emulsifiers, followed by mixing egg yolk solution into the aforementioned homogeneous substance. Also, egg solutions in general include egg solutions comprising egg yolk solely, egg white solutions comprising egg white solely and complete egg solutions comprising egg yolk and egg white, and the aforementioned egg yolk solution of the present invention includes the aforementioned egg yolk solution containing egg yolk solely as well as the complete egg solution.

Next, the emulsifier utilized may be casein or other conventional emulsifiers can also be utilized. In this regard, the casein denoted here includes salts of casein in addition to pure casein. Also, examples of emulsifiers other than casein include the substances listed in the following. (I) Egg yolk, complete egg and egg white which are utilized in raw form, frozen form or powder form but are utilized only after being put into solution. (II) Plant proteins such as soybean proteins. (III) Gum substances such as guar

gum and xanthan gum. (IV) One or a mixture selected among synthetic emulsifiers such as sucrose fatty acid esters. These emulsifiers including casein, egg yolk and gums can be utilized singly, but a mixture of at least 2 substances including casein is preferably utilized. Said emulsifiers consisting of at least 2 emulsifiers including casein denote the combined utilization of casein with at least one other emulsifier. The emulsifying power is enhanced and excellent emulsion can be sustained after heating when at least 2 emulsifiers based on casein are utilized in combination. Also, conventional oils/fats can be utilized in general. Examples of the oils/fats utilized include plants oils such as soybean oil, vegetable oils and corn oil and animal oils/fats such as lard and butter.

Next, the aforementioned raw materials are prepared by following the processes shown below, and the homogeneous substances are incorporated into the egg yolk solutions.

(I) Preparation of egg yolk solution

Egg yolk is utilized as a liquid. Specifically, the raw form is utilized, but the frozen substance may be utilized after being converted to liquid form; the powder is converted to liquid form by adding water.

(II) Preparation of homogeneous substances

Next, a homogeneous substance is produced by adding emulsifiers to oils/fats in advance. Conventional methods can be utilized for producing the homogeneous substance. For example, liquid /3
raw materials such as water and food grade vinegar may be added to emulsifiers in a mixer such as a Hobart mixer, followed by adding oils/fats and subjecting the mixture to a colloid mill for homogenization. In this regard, the quantity of the oils/fats utilized is preferably 5-60 wt% of the total homogeneous substance or 5-30 wt% of the processed egg yolk in the final product. The detaching property is poor, the coagulated eggs stick to the cylinder wall and the shape.deforms when the product

is removed if the quantity of oils/fats utilized is less than the aforementioned range. Conversely, oils can leak out from the product if excessive oils/fats are incorporated, damaging the commercial value of the product.

(III) Mixing the egg yolk solution and the homogeneous substance

The aforementioned homogeneous substance is mixed with the egg yolk solution. In this respect, the egg yolk solution and homogenous substances are fed to a tank and mixed simply by agitation by any conventional method, but the mixture after mixing and agitation is preferably passed through a colloid mill for homogenization to improve the texture of the processed egg yolk. The mixed ratio of the two substances is 0.4-30 wt% emulsified substance versus 100 wt% egg yolk solution. If the homogeneous substance is less than 0.4 wt%, the shape of the processed egg yolk deforms easily because the content of oils/fats is too little; if it is in excess of 30 wt%, a satisfactory product cannot be produced because it becomes too soft even after heating.

Next, heat-coagulated layer 11 of egg white solution incorporated with emulsifiers is formed as the inner layer of the 2-layer processed eggs, as shown in Figure 7 and Figure 8. In this respect, the egg white solution incorporated with emulsifiers denotes a substance prepared by first producing a homogeneous mixture from blending and emulsifying oils/fats with an emulsifier, followed by mixing egg white solution with the aforementioned homogeneous substance. Also, the egg white solution is not restricted to egg white solely but includes egg white mixed with egg yolk as long as it is not discolored. The oils/fats and emulsifiers utilized for the aforementioned egg yolk solution can be utilized for the egg white solution. In this regard, the quantity of oils/fats utilized is preferably 3-50 wt% versus the emulsified product obtained. If the quantity is too little, coagulating is difficult to achieve because the thermal conductivity of the egg white solution cannot be sufficiently improved. Also, if the quantity of

the oils/fats utilized is too excessive, oils can leak out from the coagulated layer of egg white and the appearance can be damaged. The homogeneous substance is produced in the same manner as in the case for the aforementioned egg yolk solution, and said homogeneous substance is then mixed with the aforementioned egg white solution. The same mixing method as in the case of the aforementioned egg yolk solution can be utilized. In this regard, the blending quantity of the aforementioned homogeneous substance is preferably 0.4-30 parts versus 100 parts of the egg white solution. If the blending quantity of the homogeneous substance is too little, the egg white solution is difficult to harden because the thermal conductivity is poor. Conversely, if the aforementioned blending quantity is too excessive, the shape retention property is compromised because the coagulated layer of the egg white solution is too soft.

Next, the egg yolk solution and the egg white solution prepared in the aforementioned manners are filled in a cylinder container of one application example of the present invention for heating and coagulating into stick form of the present invention.

In this respect, the core is inserted into the cylinder container, and the outer layer is formed by filling and coagulating the egg yolk solution in the space between the core and the cylinder wall. Also, an inner layer is formed by filling and coagulating the egg white solution in the core or inside the coagulated egg yolk solution.

One example of the aforementioned production method is shown in Figure 1 to Figure 6. In the figures, 1 is the cylinder container and 5 is the core in stick shape.

The cylinder container is not particularly restricted as long as the raw materials can be heated and coagulated, but one with the structure shown in the figures is preferably utilized. Specifically, as shown in Figure 1, the bottom part of hollow cylinder 1 is furnished with piston 2, and jacket 3 for holding hot water is furnished on the outer circumference of said cylinder 1. Furthermore, the entire of said cylinder

container is made such a way that enough support is provided for a given period of time when the cylinder is placed sideways as shown in Figure 6 while piston 2 moves back and forth inside the cylinder to push out the product to the outside.

Also, core 5 for inserting into the inner side of cylinder container 1 is in stick shape and the inside therein is open with air opening 6 in the longitudinal direction. First hot water of 90-98°C is supplied to jacket 3 of cylinder container 1 as shown in Figure 1 to heat the entire container. Next, core 5 is inserted into the center of the inner side of cylinder container 1 as shown in Figure 2, and the egg yolk solution incorporated with emulsifiers is filled into the space between cylinder container 1 and core 5. After standing for 4-8 min following the filling, as shown in Figure 3, core 5 is pulled up. In this case, the egg yolk solution is already coagulated and the egg yolk layer is prevented from deforming by the pressure from the air entering from air opening 6 of core 5 into the coagulated egg yolk layer. /4

Next, the egg white solution incorporated with emulsifiers is filled into the inside of the coagulated egg yolk layer after core 5 is raised as shown in Figure 4, and the egg white solution is coagulated by being allowed to stand for 5-15 min, as shown in Figure 5.

Afterward, the hot water in jacket 3 is removed and replaced with cooling water of 20-25°C to chill the processed eggs for 3-8 min. After the chilling is completed, cylinder container 1 is put in sideways, as shown in Figure 6, and piston 2 is operated to push out the processed egg in stick shape.

Afterward, piston 2 is returned to the bottom of cylinder container 1 and the entire container is placed vertically and filling of the raw materials is conducted again.

In this regard, the core in stick shape of the aforementioned production method can be replaced with a cylindrical core , and the egg yolk solution is heated and coagulated as the outer layer while the egg white solution can be filled in the inner side of the core and heated and coagulated therein

simultaneously. In this case, after the egg yolk solution is coagulated as the outer layer and the egg white solution is coagulated as inner layer, the product is pushed out from the core in cylinder shape.

According to the aforementioned description of the present invention, because oils/fats and emulsifiers are homogeneous and the mixture is blended with the egg yolk solution to serve as the outer layer of the 2-layer processed egg in stick shape, the coagulated layer is easily detachable from the surface of the container or from the surface of the core due to the action of the oils/fats after heating and coagulating, allowing the processed egg in stick shape to be pushed out from the container without damaging the shape. Also, because the shape of the processed egg does not deform easily when being pushed out from the core , forming a 2-layer product is made easy.

Additionally, according to the present invention, the egg yolk solution and oils/fats are not homogeneous from the beginning to carry out heating and coagulating, but the oils/fats and the emulsifiers are mixed in advance to prepare a homogeneous substance which is added to the egg yolk solution and mixed therein by thorough agitation before heating and coagulating is carried out so that no oils leak out at all from the processed egg obtained. The theory of this phenomenon is not clear, but as shown in the test examples below, a difference was observed in the leaking phenomenon of oils/fats between the processed egg of the present invention and reference product, and the reason is believed to be the inclusion of the oils/fats by the proteins in the egg yolk due to homogenization so that the oils/fats are prevented from leaking out.

Furthermore, because the inner layer is formed with an egg white solution incorporated with a homogeneous substance consisting of oils/fats and emulsifiers, the thermal conductivity is improved by the action of the oils/fats and the egg white solution can be coagulated in a short time so that no browning of the egg yolk in the outer layer results from heating.

Therefore, according to the present invention, products can be produced without deformation of the shape or leaking of oils/fats while also having an excellent appearance and beautiful color with yellow exterior and white interior. Also, 2-layer processed eggs in stick shape having excellent taste can be efficiently produced. In this respect, because casein and at least one emulsifier other than casein are combined as the aforementioned emulsifiers to enhance the thermal resistance, leaking of oils/fats is reliably inhibited during heating and coagulating. Additionally, because the resistance to freezing is also enhanced, the processed egg produced can maintain excellent emulsion stability even if the products are frozen stored.

The test examples and application examples of the present invention are shown below.

Test Example 1

Test samples of 2-layer processed egg in stick shape were produced by the following process using the raw materials shown in Table 1.

Table 1

	外面原料(g)	内層原料(g)
カゼインナトリウム	4	4
乾燥卵白	6	6
大豆油	48	48
水	42	42
全卵液	200	50
計	300	150

Key 1 Materials for the outer layer

2 Materials for the inner layer

3	Sodium casein
4	Dried egg white
5	Soybean oil
6	Water
7	Complete egg solution
8	Total

(I) Sodium casein and dried egg white were dissolved in water and the mixture was fed to a mixer, wherein soybean oil was added and mixed, followed by homogenizing with a colloid mill to obtain 100 kg homogeneous substance for the outer layer. Similarly, 100 kg homogeneous substance for the inner layer were obtained in the same manner. (II) Next, the aforementioned 100 kg homogeneous substance for the outer layer were mixed with 200 kg complete egg solution to prepare 300 kg raw materials for the outer layer. Similarly, 150 kg raw materials for the inner layer were obtained in the same manner by blending 100 kg homogeneous substance for the inner layer with 50 kg egg white solution.

Also, a reference sample of 2-layer processed egg in stick shape was produced by the following /5
process using the same aforementioned raw materials. First, sodium casein and dried egg white were dissolved in water and complete egg solution was added to the mixture in a mixer, wherein soybean oil was added and mixed, followed by homogenizing with a colloid mill to obtain 300 kg raw materials for the outer layer. 150 kg raw materials for the inner layer were produced by the same method using egg solution in place of the complete egg solution. Next, the aforementioned raw materials for the test sample and the reference sample were filled, in individual cylinder containers of an automatic production device (Produced by SAIBO Company) for producing 2-layer processed eggs in stick shape. 2-layer processed eggs in stick shape were produced by heating the jacket at 94-96°C and a forming

time of 5 min for the outer layer and a forming time of 8 min for the inner layer. The test results are shown in Table 2.

Table 2

	製造直後の外側部の状態	製造直後の内側部の状態	冷凍1ヶ月後の外側部の状態	冷凍1ヶ月後の内側部の状態
試験品	良 好	良 好	良 好	良 好
対照品	油のにじみ有	油のにじみ有	油の分離有	油の分離有

Key 1 Condition of outer layer immediately after production

2 Condition of inner layer immediately after production

3 Condition of outer layer after freezing for 1 month

4 Condition of inner layer after freezing for 1 month

5 Test sample

6 Reference sample

7 Excellent

8 Showing leakage of oils

9 Showing separation of oils

The results in Table 2 show clearly that the outer layer and the inner layer both exhibited extremely excellent quality when homogeneous substances were prepared in advance by mixing oils/fats and emulsifiers, followed by blending the mixture with the egg solutions.

Test Example 2

Test samples of 2-layer processed eggs were produced by the following process using the raw materials shown in Table 3.

Table 3

地	1	2	3	4	5	6	7	8	9	10	11
カゼインナトリウム	4	4	4	4	4	4	4	4	4	4	4
乾燥卵白	12	11	10	9	8	7	6	5	4	3	2
大豆油	0	8	16	24	32	40	48	56	64	72	80
水	84	77	70	63	56	49	42	35	28	21	14
計	100	100	100	100	100	100	100	100	100	100	100

Key 1 Sodium casein

2 Dried egg white

3 Soybean oil

4 Water

5 Total

Sodium casein and dried egg white were dissolved in water, the mixture was fed to a mixer and soybean oil was added therein and mixed, followed by homogenizing with a colloid mill to obtain 11 homogeneous substances.

Next, 0.2, 0.4, 1, 10, 30 and 40 parts of the aforementioned 11 homogeneous substances were each added, to 10 parts complete egg solution prepared in advance and mixed therein with agitation to obtain 66 raw materials for the outer layers.

Additionally, 20 parts homogeneous substance were added to 10 parts egg white solution prepared in advance by blending No. 7 ingredients and mixed therein with agitation to obtain the raw material for the inner layer.

2-layer processed eggs in stick shape were produced by the same method as in Test Example 1 using these raw materials. Table 4 shows the results.

Table 4 /6

乳化物系	1	2	3	4	5	6	7	8	9	10	11
全卵液10部：乳化物0.2部	×	×	×	×	×	×	×	×	×	×	×
〃 10部： 〃 0.4部	×	×	×	×	×	×	×	×	△	△	○
〃 10部： 〃 1部	×	×	×	△	△	○	○	◎	◎	◎	◎
〃 10部： 〃 10部	×	○	◎	◎	◎	◎	◎	◎	○	○	○
〃 10部： 〃 30部	×	◎	◎	◎	◎	◎	○	○	○	○	○
〃 10部： 〃 40部	×	△	△	△	△	△	△	△	△	△	△

Key 1 Emulsified substance No.

2 10 parts complete egg solution:0.2 part emulsified substance

3 Parts

4 Where. in the table,

x The production was not successful because the outer layer adhered to the core stick , and the outer layer was removed together when removing the core from the cylinder container.

Δ The outer layer was too hard and the surface adhered to the cylinder container such that the surface was damaged when the product was removed from the cylinder container.

O Excellent

OO Extremely excellent

Δ● The outer layer was too soft, lacking shape retention property.

Test Example 3

Test samples of 2-layer processed eggs were produced by the following process using the raw materials shown in Table 5.

Table 5

区分	1	2	3	4	5	6	7	8	9	10	11
乾燥卵白	12	11	10	9	8	7	6	5	4	3	2
カゼインナトリウム	4	4	4	4	4	4	4	4	4	4	4
大豆油	0	8	16	24	32	40	48	56	64	72	80
水	84	77	70	63	56	49	42	35	28	21	14
計	100	100	100	100	100	100	100	100	100	100	100

Key 1 Dried egg white

2 Sodium casein

3 Soybean oil

4 Water

5 Total

Dried egg white and sodium casein were dissolved in water, the mixture was fed to a mixer and soybean oil was added therein and mixed, followed by homogenizing with a colloid mill to obtain 100 kg each of 11 homogeneous substances.

Next, 5 parts homogeneous substance obtained by blending the aforementioned No. 7 ingredients were added to 10 parts complete egg solution prepared separately and mixed therein with agitation to obtain the raw material for the outer layer.

Additionally, 0.2, 0.4, 1, 10, 30 and 40 parts of the aforementioned 11 homogeneous substances were each added, to 10 parts egg white solution prepared separately in advance and mixed therein with agitation to obtain 66 raw materials for the inner layer.

2-layer processed eggs in stick shape were produced by the same method as in Test Example 1 using the aforementioned raw materials. Table 6 shows the results.

Table 6 /7

乳化物No.	1	2	3	4	5	6	7	8	9	10	11
卵白液10部：乳化物0.2 部	×	×	×	×	×	×	×	×	×	×	×
〃 10部： 〃 0.4 部	×	×	×	×	×	×	×	×	△	△	⊙
〃 10部： 〃 1 部	×	×	×	○	○	○	○	○	○	○	○
〃 10部： 〃 10 部	×	○	○	○	○	◎	◎	◎	◎	◎	◎
〃 10部： 〃 30 部	×	○	○	○	◎	◎	◎	◎	○	○	○
〃 10部： 〃 40 部	×	△	△	△	△	△	△	△	△	△	△

Key 1 Emulsified product No.

2 10 parts egg white solution:0.2 part emulsified substance

3 Parts

4 Where, in the table,

x The production was not successful because the egg white could not be coagulated due to poor thermal conductivity

Δ The inner part was too hard and the taste was not satisfactory

O Excellent

OO Extremely excellent

Δ• The inner layer was too soft, lacking shape retention property.

The test results shown in Table 4 and Table 6 reveal clearly that blending 0.4 part to 30 parts of the raw materials for the outer layer versus 10 parts egg yolk solution was desirable for the formation of the outer layer, and that blending 0.4 part to 30 parts of the raw materials for the inner layer versus 10 parts egg white solution was desirable for the formation of the inner layer.

Application Example 1

2-layer processed egg in stick shape pertinent to the present invention was produced with the raw materials and production process shown in Table 7.

1) Production of emulsified substances

First, the aqueous materials of the formulations shown below were fed to a mixer, and mixed therein to prepare a slurry, and vegetable oil was added to the mixture and emulsified therein, followed by homogenizing with a colloid mill to obtain a homogeneous substance for the outer layer and a homogeneous substance for the inner layer.

Table 7

〔外側乳化物配合〕		〔内側乳化物配合〕	
カゼインナトリウム	2%	カゼインナトリウム	2%
生卵黄	20	大豆蛋白	4
菜種油	40	グリロイド3S	0.2
食塩	1	菜種油	40
食酢	1	食塩	1
水	36	水	52.8
計	100%	計	100%

Key 1 Formulation of emulsified substance for outer layer

2 Formulation of emulsified substance for inner layer

3 Sodium casein

4 Raw egg yolk

5 Soybean oil

6 Vegetable oil

7 Glyloid 3S

8 Table salt

9 Food grade vinegar

10 Water

11 Total

2) Mixing of egg solutions and homogeneous substances

An egg yolk solution of the raw materials for the outer layer and egg white of the raw materials for the inner layer were prepared by mixing the formulations shown in Table 8, in a tank equipped with an agitator.

Table 8

(外側部配合)		(内側部配合)	
外側乳化物	100g	内側乳化物	100g
生卵黄	400	液卵白	100
計	500g	計	200g

Key 1 Formulation for outer layer

2 Formulation for inner layer

3 Emulsified substance for outer layer

4 Emulsified substance for inner layer

5 Raw egg yolk

6 Liquid egg white

7 Total

The production was conducted with the aforementioned raw materials in an automatic 2-layer processed egg production device (Produced by SAIBO Company: cylinder diameter 45 cm ϕ, core stick diameter 2.8 cm ϕ, cylinder length 20 cm).

First, hot water (94-96°C) was fed into the jacket and the core stick was inserted into the cylinder, and the egg yolk solution for the outer layer was automatically filled into the space between the cylinder and the core stick ; After 5 min, the core stick was removed from the cylinder and the egg white solution for the inner layer was filled automatically into the space created on the outside. After heating for 8 min, chilling was carried out by replacing the hot water with cold water (20°C). The piston was then operated to push out the coagulated egg from inside the cylinder to obtain a 2-layer processed egg in stick shape with egg yolk on the outside and egg white inside.

The product obtained exhibited beautiful colors for the outer layer and the inner layer as well as excellent appearance with no leaking of oils.

Application Example 2

2-layer processed egg in stick shape pertinent to the present invention was produced by the same method as in Application Example 1 using the raw materials shown in Table 8 [sic; repeated table no.].

Table 8. (1) Formulation of homogenous substance /8

〔外側乳化物配合〕		〔内側乳化物配合〕	
カゼインナトリウム	4Kg	カゼインナトリウム	4 Kg
全卵粉	10	液卵白	50
大豆油	35	大豆油	40
バター	5	ラード	5
食塩	1	食塩	1
シロ糖脂肪酸エステル	0.2	計	100 Kg
水	44.8		
計	100 Kg		

Key 1 Formulation of emulsified substance for outer layer

2 Formulation of emulsified substance for inner layer

3 Sodium casein

4 Complete egg powder

5 Liquid egg white

6 Soybean oil

7 Butter

8 Lard

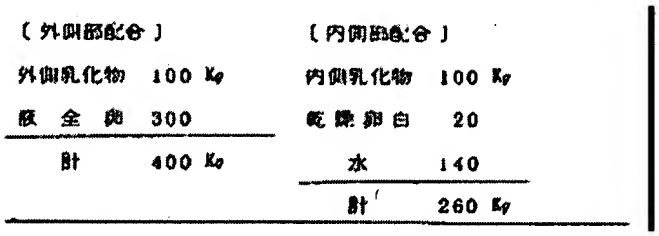
9 Table salt

10 Sucrose fatty acid ester

11 Water

12 Total

(2) Formulations of egg yolk solution for outer layer and of egg white solution for inner layer



〔外側配合〕		〔内側配合〕	
外側乳化物	100 kg	内側乳化物	100 kg
液全卵	300	乾燥卵白	20
計	400 kg	水	140
		計	260 kg

Key: 11 Water

12 Total

13 Formulation for outer layer

14 Formulation for inner layer

15 Emulsified substances for outer layer

16 Emulsified substances for inner layer

17 Liquid complete egg

18 Dried egg white

Application Example 3

2-layer processed egg in stick shape pertinent to the present invention was produced by the same method as in Application Example 1 using the raw materials shown in Table 9.

Table 9. (1) Formulation of homogenous substance

〔外側〕		〔内側〕	
液全卵	49 kg	乾燥卵白	10 kg
ゴマ油	50	ゴマ油	45
食塩	1	水	45
計	100 kg	計	100 kg

Key 1 Outer layer

2 Inner layer

3 Liquid complete egg

4 Dried egg white

5 Sesame oil

6 Table salt

7 Water

8 Total

(2) Formulations of raw materials for outer layer and for inner layer

〔外側部配合〕		〔内側部配合〕	
外側乳化物	100 kg	内側乳化物	100 kg
液全卵	150 kg	液卵白	50 kg
計	250 kg	計	150 kg

Key: 8 Total

9 Formulation for outer layer

10 Formulation for inner layer

11 Emulsified substance for outer layer

12 Emulsified substance for inner layer

13 Liquid complete egg

14 Liquid egg white

The product obtained in Application Example 2 and Application Example 3 showed no deformation while exhibiting excellent appearance and colors.

Brief description of the figures

Figure 1 to Figure 6 are descriptive diagrams showing the production processes of the present invention. Figure 7 shows an external view of 2-layer processed egg in stick shape while Figure 8 is the cross-sectional view thereof.

Where in the figures, 1 ... Cylinder container; 2 ... Piston; 3 ... Jacket; 5 ... Core ; 6 ... Air opening; 10 ... Egg yolk layer; 11 ... egg white layer.

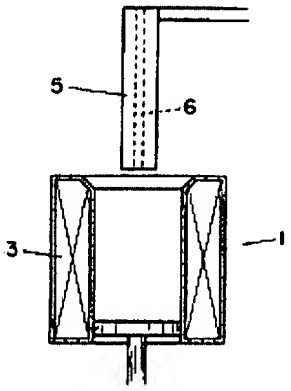


Figure 1

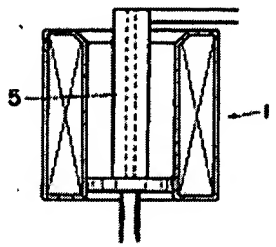


Figure 2

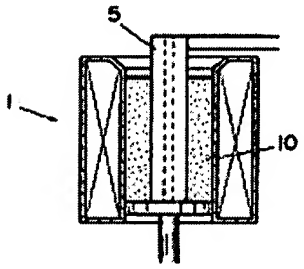


Figure 3

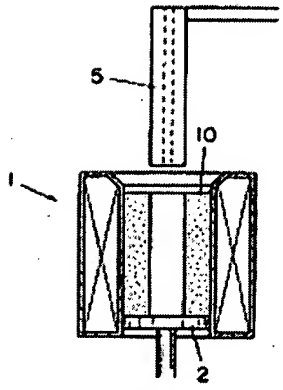


Figure 4

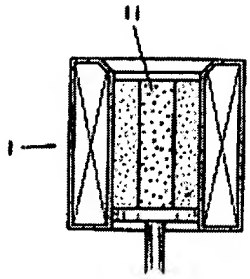


Figure 5

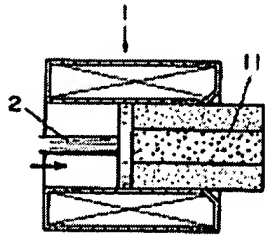


Figure 6

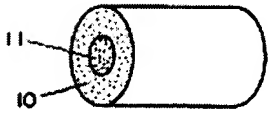


Figure 7

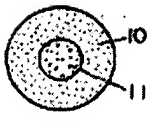


Figure 8

PTO 08-0073

CC = JP
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Kokai
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SONOYA JP57-12987

FOOD CONTAINER FOR HEATING AND FOOD CONTAINED THEREIN
[Kanetsu Shokuhin Yoki to Sono Kitsuzo Shokuhin]

Setsuko Sonoya

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. OCTOBER 2007
TRANSLATED BY: THE MCELROY TRANSLATION COMPANY

PUBLICATION COUNTRY	(19):	JP
DOCUMENT NUMBER	(11):	57012987
DOCUMENT KIND	(12):	Kokai
PUBLICATION DATE	(43):	19820122
APPLICATION NUMBER	(21):	55087853
APPLICATION DATE	(22):	19800630
INTERNATIONAL CLASSIFICATION[3]	(51):	A 23 L 3/00
INVENTOR	(72):	Setsuko Sonoya
APPLICANT	(71):	Setsuko Sonoya
TITLE	(54):	FOOD CONTAINER FOR HEATING AND FOOD CONTAINED THEREIN
FOREIGN TITLE	[54A]:	[Kanetsu Shokuhin Yoki to Sono Kitsuzo Shokuhin]

Claim

A food container for heating characterized by having a container body and an inner tube sharing the bottom base; storing at least two kinds of dishes prepared differently, that is, a main dish and a side dish separately by packing them in a doughnut-shaped space and cylinder space formed by the container body and inner tube; having a common cover with degassing valves respectively connected to the head spaces of the doughnut-shaped space and cylinder space individually sealing the doughnut-shaped space and cylinder space; installing a tight sealing band at the periphery of the cover; bonding a sealing band to the container body; and allowing the inner tube to function as a heat transmission medium; and foods contained in it.

Detailed explanation of invention

This invention pertains to a food container suitable for long-term storage with its heating easily achievable and to the food contained in it.

It is a fact that many previously available foods packed in cans appeal to almost the same type of taste and flavor and food satiation sensations regardless of the ingredients such as meat, fish, vegetable or a mixture thereof seasoned for general preference except for those cooked in water with little salt or oil.

This is attributable to the flavor of particular solid contents of cans being lost due to their preparation involving pouring an almost generic liquid into the packed solid contents, heating this and soaking for a long period of time inside the cans and excluding certain cases, disproportional emphasis on almost single ingredients.

The main objective of this invention is to provide a packed food product wherein the same type of taste and flavor and food satiation sensations is alleviated as much as possible and at the same time, balanced

properties with respect to nutrition and taste are realized and furthermore, a food container enabling simple heating of the contents.

In general, canned foods have been used previously mostly by opening the cans and eating the foods as they are, cooking with other ingredients different from the conned foods or eating them after heating in another container. Direct heating of canned foods has been attempted, but the time required for heating is too long to popularize this method. To heat, the can is placed in boiling water, and the content of the can is gradually heated by thermal transmission from the outside to the inside of the can, but this thermal transmission is very slow.

On the other hand, if the can is opened (by removing the cover) first, there is a problem of the possibility of entry of hot water inside the can, or if the can is heated directly, it becomes too hot to handle after heating, and this is very inconvenient.

This invention is to solve those problems of the prior art, and it is to allow foods to be suitable for daily dietary life without losing the original purpose of the canned foods, and at the same time, it is also designed for instant-type foods.

The container of this invention will be explained by referring to the drawings as follows.

A cylindrical can-type container prepared by molding a thermoplastic resin will be explained as an example. The container body 1 of Figure 1 is cylinder-shaped similarly to conventional cans for foods, and inside this cylindrical container body 1, there is a vertical inner tube 2 with a bottom base 3 formed in a single body. This bottom base 3 molded together with the container body and inner tube has an expansion ring 4 at the bottom and base of the inner tube 2, and a protection ring 5 is installed at the corner formed by the container body 1 and bottom base 3. Furthermore, the container body 1 has a flange 6 that expands slightly towards the outside of the container body 1 as shown in Figure 2, an extrusion 7 slightly thicker

than the container body 1 is formed at the bottom of the flange 6, and the end 8 of the inner tube 2 is formed parallel to the height of the flange 6 of the container body 1.

In the figure, a cover 9 has a shape such that the flange 6 of the container body 1 and end 8 of the inner tube 2 can be engaged, a portion 11 engaged with the flange 6 of the container body 1 with a female shape of the flange 6 for insertion and a protection ring 16 formed in a convex shape. A U-shaped wall 12 forms an engaging groove 17 for the end 8 of the inner tube 2, and over it, a convex expansion ring 13 is installed. Furthermore, the U-shaped wall 12 is allowed to have a height corresponding to the expansion observable at the time of sterilization of foods to be packed.

Furthermore, along the periphery of the portion 11, a tight, skirt-shaped sealing belt 15 having the diameter of the extrusion 7 formed on the container body 1 and a length reaching the bottom end of it is also formed.

As shown in Figure 4 and Figure 5, the convex expansion ring 13 formed on the cover 9 has degassing valves 18 and 18' at a minimum distance from each other. They are valves necessary for degassing procedures explained later. A valve seat 19 is formed so that the centers of the degassing valves 18 and 18' are on a lateral center line of the cover 9, a degassing hole 20 is perforated, a pressure injection hole 22 is formed at the top, these features are molded with the same plastic processing as that of the cover 9, and as shown in Figure 3, a seal packing 14 is inserted.

The container described above is an example prepared by molding a thermoplastic resin, but in another application example, an open-top can be made of a metal plate such as a tin plate, a can body having a small diameter is installed inside by soldering to form an inner tube 21 [sic; 2'], and the same cover 9 as described above is used.

Specifically as shown in Figure 6, on an open-top can D with bottom base 3' and can body 1' prepared by curling and fastening procedures, an extrusion 23 is attached on the can body 1' by gluing with an

adhesive, the inner tube 2' is bent at the end at the bottom base 3' to form a flange 24, and the flange 24 and bottom base 3' are soldered to form a close bonding.

As shown in Figure 1, the container prepared as described above has a doughnut-shaped space A formed by the container body 1 or open-top can D and inner tube 2 or can inner tube 2' and cylinder space B of the inner tube 2 or can inner tube 2', and the can has independent spaces when the cover 9 is installed to form a tightly sealed state.

Foods to be packed in the container are explained as follows.

In general, foods called prepared foods (accompanying dishes) consist of fish, animal, bird or whale meat or their mixture with vegetables as a main ingredient and vegetables, fruit, seaweed, etc., as a sub-ingredient.

The main objective of this invention is to carry out packing of ingredients according to the above conceptual classification, and many kinds of ingredients can be selected and combined to accommodate the original condition of canned foods.

The preference of ingredients to be used and the extent of seasoning (proportion of seasoning agents to be used) have individual differences but some examples of prepared foods (accompanied dishes in the case of rice, bread or noodles as a staple food) are shown in the following table

Staple food	Accompanying food
Hamburger steak with demi-glace sauce	Fried potatoes or carrots
Boiled square cut pork	Cherry tomatoes, carrots, mushrooms or bamboo shoots in oil
Chicken cooked with onions (small) and tomatoes	Japanese Butterbur, lotus roots, arum root cake or carrots with bland seasoning
Ham wrapped with cucumbers in oil	Small eggplants (round eggplants), green beans or

	shiitake mushrooms boiled
Mackerel cooked with ginger and soy sauce	Broad beans, lotus roots or burdock cooked with seasoning
Beef curry with apples	Shrimp or asparagus boiled in water

The main dishes and accompanying dishes conceptually classified as described above are packed in the container described above with the main dish in doughnut-shaped space A and the accompanying dish in cylinder space B.

In general, the basic steps for canned food production are as follows.

Cooking – packing – degassing – curling and fastening – sterilization – cooling

However, in this invention, the container and foods to be packed are sterilized separately, the container is packed with the foods under sterile conditions, and after degassing, the container is tightly sealed, sterilized and finally cooled.

Specifically, the flow is as follows.

Cooking –

sterilization – packing – degassing – tight sealing – sterilization – cooling

Container

If a food is treated with general procedures, there is a time delay (2-3 h) from cooking to sterilization. This may be sufficient for proliferation of fast-growing bacteria to generate gas or acid and cause decomposition of the food.

The procedures of this invention for packing foods, degassing and tight sealing will be explained by referring to Figure 1 as follows.

First of all, the container and prepared foods are sterilized separately, the main dish is placed in the doughnut-shaped space A, the accompanying dish is placed in the cylinder space B, and if there is any liquid, it is also poured in.

Subsequently, pressing is implemented so that the flange 6 on the side of the container body 1 and end 8 of the side of the inner tube 2 are engaged with the engaging portion 11 and engaging groove 17 of the side of the cover 9, respectively allowing the respective parts to engage completely. Furthermore, the extrusion 7 on the side of the container body 1 and tight sealing band 15 on the side of the cover are tightly sealed by thermal fusion or with an adhesive.

During these procedures, the above state of pressing is not released until tight sealing is completed.

The above tight-sealing procedures are carried out under a vacuum, the air and gas in a head space C of the doughnut-shaped space A and in a head space C' of the cylinder space B are degassed to a degree of vacuum through the degassing valve 18 on the doughnut-shaped space A and degassing valve 18' on the cylinder space B.

Specifically, the degassing valve 18 on the doughnut-shaped space A has a degassing hole 20 opened at the center of the valve seat 19 installed on the side of the head space C, and the other side has a perforated injection hole 22.

After the air and gas in the head space C are degassed under a vacuum as described above, a ball 21 is injected with pressure from the injection hole 22 and is pressed against the valve seat 19.

The lateral center of the ball 21 injected with pressure is on the lateral center line of the cover 9, and thus, it is pressed strongly with the outer pressure further increasing the tight sealing.

The degassing valve 18' at the head space C' of the cylinder space B carries out the same function as the degassing valve 18 installed on the side of the doughnut-shaped space A.

Subsequently, double sterilization of the sealed container with foods packed as described above is carried out.

The mean pH of the foods packed according to this invention is approximately neutral in the range of 5-7 in many cases, and thus, high-temperature sterilization above 100°C is necessary.

A container made of a thermoplastic resin has a relatively low plastic processing temperature range of 220-300°C, and consequently, the heat resistance of the container is limited.

The packed foods are cooked, sterilized and packed as described above. Thus, the double sterilization can be carried out at a relatively low temperature by considering the temperature and time depending on the heat resistance of the container to achieve so-called commercial sterilization.

The behavior of the container during the sterilization procedure is explained by referring to Figure 1 as follows. The whole container is heated with a heating medium such as steam, hot air, or high-pressure hot water as a result of thermal transmission from the outer wall of the container to the foods contained inside.

The foods heated as a result of this heat transmission are expanded causing the cover 9 to expand outwards.

At this time, the edge 8 of the inner tube 2 slides inside the engaging groove 17 of the cover 9 at a distance corresponding to the proportion of expansion, but the length of the U-shaped wall 12 is set to compensate this proportion.

The state of the flange 6 of the container body 1 and engaging portion 11 of the cover 9 is sustained in the engaged state.

The tight sealing band 15 and extrusion 7 are completely bonded by thermal fusion or with an adhesive to enable coping with the significant tension generated as a result of expansion.

Furthermore, the container body 1 and inner tube 2 also receive compression due to expansion, but they are cylindrical, the material used shows some expandability, and thus, they can perform satisfactorily.

Because of the favorable structural configuration, the bottom base 3 is hardly deformed with pressure.

At the time of heating sterilization of packed foods, the heat is desirably transmitted inside the packed foods as fast as possible.

In general, food thermal conductivity is very poor, and as a result, a long heating time and quality reduction of the packed foods are possible.

In the container of this invention, the configuration is such that the inner tube 2 shown in Figure 1 penetrates through the center portion of the packed foods, and this inner tube 2 acts as a heat transmission medium yielding a remarkable effect.

Cooling is generally carried out as quickly as possible.

The displacements of various parts as a result of expansion are allowed to return to the levels at the time of sealing as a result of cooling.

Furthermore, the convex expansion ring 13 installed on the cover 9 returns to its original shape after cooling as a result of the same principle that is known for conventional cans.

As shown in Figure 3, the edge 8 of the inner tube 2 becomes engaged with the packing 14 inside the U-shaped groove 17 on the side of the cover 9 to return to the state at the time of sealing.

In the case of the series of procedures of sterilization, packing, degassing, sealing, sterilization and cooling in the case of open-top can D shown in Figure 6 as another application example of this invention, the explanation is omitted because it overlaps those for the container made of a thermoplastic resin explained above in the first application example of this invention.

The effects of this invention described above may be summarized as follows.

(1) Prepared foods (dishes) by at least 2 cooking methods are used and thus, the same taste and flavor and consequent food satiation sensation are not provided.

(2) For example, a dish with meat as the main ingredient and another dish with vegetables as the main ingredient are packed in a single container enabling the provision of a broad range of dishes. Consequently, it is relatively easy to achieve nutritional balance or broaden the taste and flavor range.

(3) Because of the inner cylinder installed inside the container, the heating is extremely fast with this inner cylinder acting as a medium for heat transmission providing a new type of instant food product.

(4) No special tools (such as a can opener) are required for opening the cover.

Brief description of the figures

Figure 1 is a vertical cross-sectional drawing of a container of this invention, Figure 2 is an F-F cross-sectional drawing of Figure 7, and Figure 3 is a drawing showing the details when the inner tube 2 and cover 9 are engaged.

Figure 4 and Figure 5 are detailed drawings of the degassing valves 18 and 18', Figure 6 is a vertical cross-sectional drawing of an open-top can D as another application example of this invention, and Figure 7 is a plan view drawing of the container of this invention.

1, 1': container body, 2, 2': inner cylinder, 3, 3': bottom base, 4, 4': expansion ring, 6: flange, 7: extrusion, 8: end, 9: cover, 11: engaging portion, 12: U-shaped wall, 13: expansion ring, 14: packing, 15: tight seal band, 17: engaging groove, 18, 18': degassing valve, 20: degassing hole, 21: ball, 23: extrusion, A: doughnut-shaped space, B: cylinder space, C, C': head space, D: open-top can

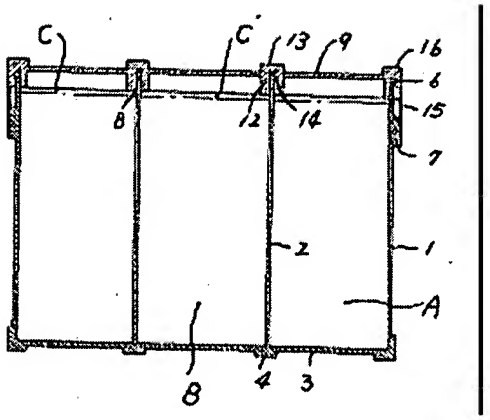

Figure 1

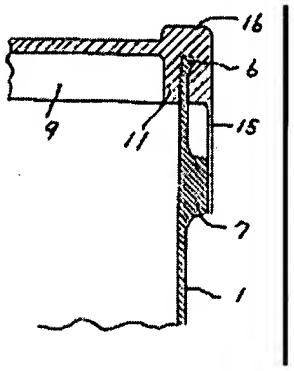

Figure 2

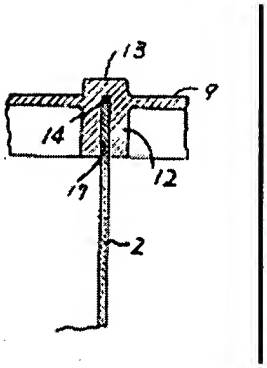

Figure 3

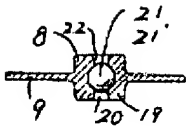

Figure 4

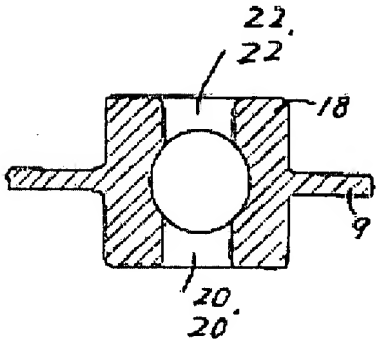

Figure 5

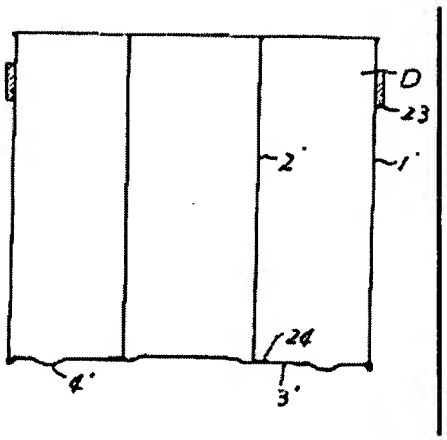

Figure 6

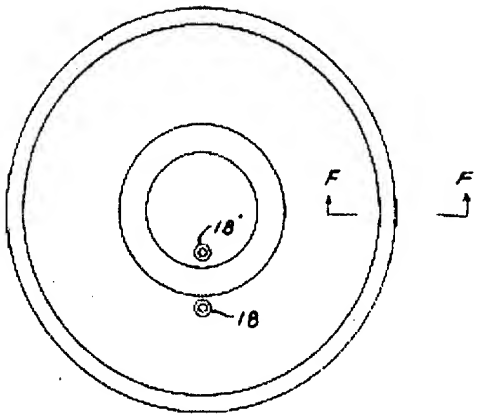

Figure 7